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TREES

A WOODLAND NOTEBOOK

CONTAINING OBSERVATIONS ON CERTAIN
BRITISH AND EXOTIC TREES

ILLUSTRATED WITH PHOTOGRAPHS BY MR. HENRY IRVING AND OTHERS

BY THE

RIGHT HON. SIR HERBERT MAXWELL

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Sit here by me, where the most beaten track
Runs through the forest—hundreds of huge oaks,
Gnarled, older than the thrones of Europe. Look,
What breadth, height, strength—torrents of eddying bark!
Some hollow-hearted from exceeding age
(That never be thy lot nor mine!)—and some
Pillaring a leaf-sky on their monstrous boles,
Sound at the core as we.

TENNYSON'S *The Foresters*, iii. 1.

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To the Reader

THE following chapters, which have their origin in papers originally contributed to the *Scotsman*, are designed to meet, and possibly to stimulate, that interest in British woodland resources which has so greatly increased within recent years. The author's aim has not been to present either a scientific botanical treatise or a manual of technical forestry; he has attempted to describe the leading characteristics of the forest growths indigenous to the United Kingdom, and to indicate those exotic species which have proved, or are likely to prove, best adapted to the British climate, whether as economic or purely decorative subjects.

There has been in the past—there prevails to a considerable extent in the present—confusion among British planters between the two branches of woodcraft—silviculture and arboriculture. Silviculture or forestry—the science of managing woodland to produce serviceable timber—has been so grossly neglected in the United Kingdom that its cardinal principles have had to be learnt afresh. Accustomed to rely upon foreign imports for our timber supply, we

came to look upon woodland as a luxury, useful in so far as it provides shelter from storm, cover for game and foxes, and ornament to the landscape, but of negligible commercial value. Of this result the titles of the associations formed for the promotion and study of wood-craft are very significant; they are not styled Forestry Societies or Silvicultural Societies, but Royal Arboricultural Societies. Ever since the days of Tradescant and John Evelyn, British planters have excelled in arboriculture—the skilful rearing and tending of choice trees and their disposal singly or in groves for the decoration of parks and pleasure-grounds. Now, however, that the world's consumption of timber has overtaken, and bids fair soon to overtax, the supply, attention is being directed to the extent of forest capabilities in the United Kingdom. The development of these resources can be accomplished only through systematic forestry, as prescribed in the science of silviculture. We are the only considerable nation in Europe whose Government neglects forestry as a source of revenue; we have, consequently, immense leeway to make up. Timber of every description is a crop of long rotation, exceeding, in some cases far exceeding, the average duration of human life. One generation has to plant trees for the advantage of its successors; but it is just that kind of long-range altruism which chiefly distinguishes civilised from barbarous nations.

To the Reader

Let me not be interpreted as underrating the value of the work done by arboriculturists. By the enterprise of our leading nurserymen, the intrepidity and zeal of their collectors, and the eagerness of landowners to embellish their estates, a vast experimental stage has been accomplished, enabling one to form a fair estimate of the adaptability of different exotic trees to the climate of the British Isles. The results of this experimental period have been summed up recently in the great work of Mr. Elwes and Dr. Henry, who have devoted many years of strenuous labour to examining the conditions of tree growth in all four Continents, and recording the behaviour of different species when planted in this country. The extent and thoroughness of their survey, and the critical experience they have brought to bear upon the subject, give a special value to their testimony to the work of British arboriculturists. "After having seen the trees of every country in Europe, of nearly all the States of North America, of Canada, Japan, China, West Siberia and Chile, we confidently assert that these islands contain a greater number of fine trees from the temperate regions of the world than any other country." [1]

It was high time that, in the material interest of the community, endeavour should be made to establish an organised forest industry in the United

[1] *Trees of Great Britain and Ireland*, Introduction, p. xv.

Kingdom. The Government, after many years of reiterated enquiry and hesitation, have at last taken the first steps in the establishment of State forest. At present, these steps have not carried the matter very far; but great bodies get slowly under way; as one may not judge the speed of an Atlantic liner by the rate at which she leaves the harbour, so we should exercise patience during the initial stages of what we hope may prove a great enterprise.

The newly formed Forestry Departments of the English, Scottish, and Irish Boards of Agriculture have the results of experimental planting by arboriculturists to guide them in their choice of species. The opinion is sometimes expressed that British forests should be composed of indigenous species, on the principle that Nature has indicated which species are best adapted to our soil and climate. This is to overlook the part played by chance in determining what trees and herbs should form the vegetation of these islands. When the ice-mantle was slowly being withdrawn, after grinding down the mountains to mere stumps of their pristine stature and strewing the plains with glacial débris, seeds wafted by winds and waves or borne by birds found a footing, and those for which the conditions of soil and climate then prevailing were suitable, established themselves most readily and formed the staple vegetation. But those conditions have greatly altered since that far-off time; vegetation itself is

To the Reader

a main agent in changing the character of the surface soil, adapting it to support growths of a different character to those which first took possession thereof. It is, therefore, no derogation to the admirable qualities of our native oak, ash, and pine that it has been found to our advantage to cultivate such exotic species as larch, spruce, sweet chestnut, and sycamore. Among the vast variety of foreign forest trees introduced to this country during the nineteenth century, it is almost certain that some will prove of great economic value when submitted to scientific treatment.

I have endeavoured in these pages to recapitulate in a convenient form what has been ascertained by experiment of the behaviour of foreign trees under British conditions, relying, not blindly, upon the conclusions arrived at by masters of the craft, as corroborated or checked by personal observation of a practical and somewhat sedulous nature, extending over youth, manhood, and old age.

Among those to whom I owe cordial thanks for providing negatives and other material for illustration are the Duke of Northumberland, the Earl of Radnor, the Hon. Hew H. Dalrymple, Professor William Somerville and Mr. Gerald Loder.

HERBERT MAXWELL.

MONREITH, 1914.

Contents

		PAGE
I.	The Oak	1
II.	The Beech	16
III.	The Spanish Chestnut	26
IV.	The Ash	33
V.	The Linden Tree or Lime	42
VI.	The Elms	49
VII.	The Sycamore and other Maples	56
VIII.	The Plane	64
IX.	The Horse Chestnut	69
X.	The Poplars	75
XI.	The Birch	82
XII.	The Willows	89
XIII.	The Hornbeam	96
XIV.	The Alder	99
XV.	The Tulip Tree	105
XVI.	The Hawthorn	108
XVII.	The Rowan and its Relatives	117
XVIII.	The Gean Tree, or Wild Cherry	124
XIX.	The Walnut	130
XX.	The Holly	137

Contents

		PAGE
XXI.	Pea-flowered Trees	144
XXII.	The Elder	152
XXIII.	The Hazel	156
XXIV.	The Ailanto	159
XXV.	The Pines	161
XXVI.	The Silver Firs	174
XXVII.	The Spruce Firs	183
XXVIII.	The Cedar	190
XXIX.	The Larch	197
XXX.	The Yew	205
XXXI.	The Cypress and its Kin	214
XXXII.	The Wellingtonia and the Redwood	221
XXXIII.	The Gingko or Maidenhair-Tree	229
XXXIV.	The Araucaria or Monkey Puzzle	233

List of Illustrations

PAGE

Judas Tree (*Cercis siliquastrum*) - - - *Frontispiece*
At Twyford Lodge, Winchester

Pedunculate Oak - - - - - - - - - 2

Sessile Oak - - - - - - - - - - 6

Queen Beech at Ashridge - - - - - - 18
Reproduced by permission from *The Gardeners' Chronicle*

The Chairmaker, Buckingham Beech Woods - - 22

Spanish Chestnut in Summer - - - - - - - 26

Spanish Chestnut in Winter - - - - - - - 26

Manna Ash (*Fraxinus ornus*) - - - - - - 34
At Wakehurst Place

Common Lime (*Tilia vulgaris*) - - - - - - 42

Flower of the Linden Tree (*Tilia Europœa*) - - 44

Weeping White Lime (*Tilia petiolaris*) - - - - 46
At Wakehurst Place

English Elm (*Ulmus campestris*) - - - - - 48

Wych Elm (*Ulmus montana*) - - - - - - 50

The Great Elm at Magdalen College, Oxford - - 54

Sycamore (*Acer pseudo-platanus*) in Summer - - - 56

Sycamore in Winter - - - - - - - 58

List of Illustrations

PAGE

Fruit of Sycamore (*Acer pseudo-platanus*) - - - 60

Horse Chestnut (*Æsculus hippocastanum*) in Bloom - 68

Horse Chestnut Flower Spike - - - - - 68

Aspen Tree (*Populus tremula*) - - - - - - 74

White Poplar (*Populus alba*) in July - - - - 78

White Poplar in December - - - - - - 78

Lombardy Poplar in Summer - - - - - - 80

Lombardy Poplar in Winter - - - - - - 80

Birch (*Betula alba verrucosa*) in June - - - - 84

Birch in December - - - - - - - - 84

Willow by the Stream - - - - - - - 88

Fruit of Hornbeam (*Carpinus betulus*) - - - - 96

Tulip Tree - - - - - - - - - 104
At Wadham College, Oxford

Tulip Tree (*Liriodendron tulipifera*) - - - - - 104
At Albury Park

May Blossom (*Cratægus oxyacantha*) - - - - - 108

Fruit of Hawthorn (*Cratægus oxyacantha*) - - - 108

Flowers of the Rowan (*Pyrus aucuparia*) - - - 118

Gean (*Prunus avium*) in Bloom - - - - - 128

Black Walnut (*Juglans nigra* var. *Alburyensis*) - - 136
At Albury Park

Pagoda Tree (*Sophora japonica*) - - - - - 144
In the Botanic Garden, Oxford

Flower of Laburnum - - - - - - - 146

Robinia pseudacacia at Winchester - - - - 148

List of Illustrations

PAGE

Flower of Robinia pseudacacia - - - - - - 150

Elder (*Sambucus niger*) in June - - - - - - 154

Elder in December - - - - - - - - - 154

Ailanthus glandulosa - - - - - - - - 158
At Wadham College, Oxford

Scots Pine Wood - - - - - - - - - 162

Flower and Fruit of Scots Pine - - - - - - 166

Silver Firs (*Abies pectinata*) - - - - - - - 176

Douglas Firs (*Pseudotsuga Douglasii*) - - - - - 184
Planted at Taymount in 1860

Cones of Norway Spruce (*Picea excelsa*) - - - - 186

Larch in Spring - - - - - - - - - 196

Larch Flowers (Male and Female) and Cones - - 196

Fruit of Yew (*Taxus baccata*) - - - - - - - 206

In the Yew Wood near Downton, Wilts - - - 208

Monterey Cypress (*Cupressus macrocarpa*) - - - - 214
At Wakehurst Place

Deciduous Cypress (*Taxodium distichum*) - - - - 216
At Syon

Gingko biloba - - - - - - - - - - 228
At the Grove, Watford

Avenue of Araucaria imbricata - - - - - - 232
At Castle Kennedy, Wigtownshire

Araucaria imbricata, Male Flower - - - - - 234

Araucaria imbricata, Female Flower - - - - - 234

The Oak

THE literature of the oak far exceeds in volume that of any other tree, and there is abundant evidence to prove that from earliest times it was regarded not only with esteem for its timber, but with religious reverence. Popular names of trees are uncertain guides; the revisers of the Old Testament express a doubt whether the tree under which Jacob buried the strange gods which he took from his household (Genesis xxxv. 4) was really an oak, as it is rendered in the authorised version, or a terebinth; but there seems to be no question about the tree Homer had in his mind when he describes Zeus as giving his oracles from the oaks of Dodona (*Odyssey*, xiv. 328), for the Greeks held the oak sacred to their premier deity.

Pliny (A.D. 23-79), writing about a thousand years later than Homer, describes in detail the religious honour paid to the oak in Britain, and asserts that the Druids, as children of the oak, were so called from the Greek name for that tree, i.e. δρῦς. We are able to check his statements in one particular from our own experience. He says that the Druids held the

mistletoe as the most sacred of plants, provided it grew upon an oak, which it did very rarely. It is still so seldom to be seen on that tree that, although I have been on the lookout for an instance for many years, both in England and in Continental oak forests, I have never yet found one. Mr. Elwes, indeed, gives a list of twenty-three oaks in England reputed as bearing mistletoe; but he has only succeeded in verifying two of these by personal inspection.[1]

That the early Celtic inhabitants of the British Isles set as high a value upon the timber of the oak as they did upon its mystic attributes, must be patent to any one who has explored their ancient lake dwellings. The framework of these artificial islands was made of massive oak beams morticed together; these remain as hard and sound as the day they were laid down in the water; while every other kind of wood used in the interior of the structure—ash, alder, pine, etc.—has been reduced to the consistency of soft cheese. Moreover, these people anticipated the Admiralty in using oak for shipbuilding. All the many canoes which have been discovered in connection with these islands (five were found in Dowalton Loch alone) have been "dug-outs" fashioned from trunks of oak thirty or forty feet long. If other and more easily worked timber was ever employed for this purpose, it has failed to withstand the tooth of time.

The application of iron to shipbuilding and architecture has done much to dethrone the oak from its

[1] *Trees of Great Britain and Ireland*, ii. 334.

PEDUNCULATE OAK

former pre-eminence, nor does its timber command the high prices of a hundred years ago. But it has no rival for dignity and durability, and very few equals in beauty, for domestic architecture and public buildings. Moreover, signs are not wanting that the supply of pitch pine and other cheap foreign substitutes for British oak is not inexhaustible; consumption is increasing hand over hand, and natural forests are being stripped far faster than they can be regenerated. British oak, therefore, though it is under temporary commercial eclipse, can never fail of producing timber of the very highest quality, and, owing to its long span of vigorous life, the tree may be left standing in the forest for centuries without deteriorating.

Those who desire a quick return from their woodland will hardly be encouraged to plant oak from such a far-sighted consideration; but forestry must always be a business of deferred profits. If ash be esteemed commercially mature at seventy years, larch and Scots pine at eighty or ninety, oak cannot be reckoned ready for the axe at less age than one hundred and twenty, and it continues to improve up to two hundred years.

Even allowing for the fall in value of oak timber and bark in recent years, high prices may still be obtained for fine trees, whereof there would have been far more in Britain at this day but for the excessive drain upon our woodland resources for the Navy during the eighteenth and nineteenth centuries. In 1877 Messrs. Groom, of Hereford, paid £200 for a huge oak felled at Tyberton Park in Herefordshire.

This grand tree stood 130 feet high, with a girth of 22 feet 8 inches at 5 feet from the ground. It was felled after being struck by lightning and badly damaged; but for which mishap the purchasers estimated its value would have been £300.

In Kyre Park, Worcestershire, there still stood in 1907 an oak 113 feet high, with a straight trunk of 90 feet, for which the owner had declined an offer of £100 a few years previously.

In certain parts of England, chiefly in the eastern counties, the timber of some oaks is found to have assumed a rich brown hue, instead of the normal pale fawn. The cause of this is obscure; some botanists consider it to be produced by a fungoid growth; others, that it is the combined effect of age and soil; but, whatever be the agent, the result is to enhance enormously the market value of such trees. American cabinetmakers first created a demand for it, as much as 10s. a cubic foot being readily obtained for the best quality. Unfortunately, brown oak has not yet been recognised as occurring north of the Trent.

Botanists are not agreed whether the oaks of Great Britain consist of a single species or of two. There are certainly two distinct races, as was recognised by Linnæus 150 years ago, when he classified them, probably correctly, as sub-species—the durmast or sessile-flowered oak (*Quercus robur sessiliflora*) and the pedunculate oak (*Q. robur pedunculata*). Roughly speaking, the native oaks of the eastern and southern parts of Great Britain are of the pedunculate race; those of the western parts and of Ireland are of the

sessile-flowered type; but I have examined the old oaks in the Forest of Arden, Warwickshire, and found them to be durmast, while young trees, planted to replace blown ones, were all of the pedunculate kind. In the beautiful park of Knole, near Sevenoaks, there are hundreds of fine indigenous oaks, all pedunculate; but a splendid avenue, planted apparently 180 or 200 years ago, has been laid through them, and these trees are all durmast. I do not know of any place where the contrast between the two species may be so easily studied.

When grown in moderate shelter, the two kinds may be readily distinguished from each other by their habit of growth. Owing to the terminal bud on every shoot of the durmast oak being the strongest, the stem and branches are much straighter than those of the pedunculate oak, which puts its strength into lateral buds, giving the boughs that twisted, gnarled appearance so characteristic of much English woodland. In exposed situations, however, this distinction cannot be relied on, and one must examine the leaves and fruit as tests.

The durmast oak bears sessile flowers—that is, without foot stalks; the acorns, therefore, sit close to the shoot on which they are borne. On the other hand, the leaves are carried on footstalks clear of the twig. In the pedunculate oak these features are reversed, the flowers and acorns being stalked and the leaves stalkless. The leaves, also, which are more irregular in shape than those of the durmast, clasp the twig more or less closely with auricles or lobes.

The durmast never has these auricles, but the other features mentioned are liable to be modified, when recourse must be had to a less uncertain detail, easily distinguished through an ordinary lens. The back of a mature leaf of the pedunculate oak is perfectly smooth, without a trace of down or pubescence ; that of the durmast invariably carries some fine down, at least in the angles of the leaf-nerves.

It may seem that these differences are of no more than botanical interest ; but they carry an important significance to the forester. The timber of the two species being of equal quality, it is of course desirable to plant that kind which produces the straightest timber. Undoubtedly in this respect the durmast far surpasses the other. Unfortunately, owing to the durmast oak bearing acorns far less frequently than the pedunculate oak, British nurserymen have stocked the latter almost to the exclusion of the durmast, seed of which can only be obtained in favourable seasons, often at an interval of several years. Nevertheless, the superiority of the durmast, especially for Scotland and the north of England, is so great, that it is worth taking pains to secure it.

The native oaks of the English lake district and of the shores of Loch Lomond are all of the durmast variety ; when opportunity occurs of obtaining seed from these it should not be allowed to slip. Even in the south, durmast oak has proved its superiority to the other. Besides being far the handsomer tree, with richer foliage, it is generally immune from the attacks of that curse of English woodland, the cater-

SESSILE OAK

pillar of the little moth, *Tortrix viridana.* "I have seen," says the Hon. Gerald Lascelles, Deputy Surveyor of the New Forest, "I have seen a sessile oak standing out in brilliant foliage when every other oak in the wood around was as bare of leaf as in winter."

Most writers on forestry follow one another in describing durmast oak as suiting dry soils and pedunculate oak as preferring rich and moist soil. That is quite at variance with my observation. If the soil of Surrey, where the native oak is pedunculate, be compared with that of the English lake district and the west generally, where the durmast is indigenous, there can be little question which is the moister. The fact is the durmast, being the more vigorous tree, is able to thrive in a soil too dry and poor to support the pedunculate oak.

One word of counsel to planters on soil tending to dryness—never plant oak forest pure, but let beech be mixed with the oaks. The importance of this is well known to German foresters, who call beech the doctor of the forest. Its dense foliage prevents undue evaporation under parching winds and scorching sun, and its heavy leaf-fall in autumn creates the best kind of forest soil.

No clearer example can be given of the failure of ancient oaks, not from extreme age, but from the parching of the soil, than is presented in Sherwood Forest. The giant trunks that stand there singly or in scattered groups once supported a far loftier dome of foliage than they do now. The branches have died

back through the vigour of the tree being sapped by excessive evaporation from the ground, consequent on the loss of forest canopy and undergrowth. Within Lord Manvers's park of Thoresby, formed long ago by enclosing part of the Forest, oaks of the same age as those outside stand in close company with the fostering beech, and clothed with dense foliage to the very end of the branches. How often has one heard a forester, when a great oak goes "stag-headed," explain this as the result of the roots getting down to unsuitable subsoil; whereas the true reason is that an oak cannot fulfil his allotted span of years except when grown in close company of other trees.

As might be expected, the oak, as monarch of the primæval British forest, has contributed names to countless places, both in Celtic and Sáxon speech; besides a few in Norman French, whereof Chenies, a parish in Bucks, may serve as an example. The Saxon *ac*, still current in the north, but supplanted in the south by the broader "oak," is easily detected in such names as Acton, Aikton, Ackworth, Akenham, in England; Aikrig, Aikenhead (sometimes disguised by an intrusive *t* as Aitkenhead) and Aiket, which is a contraction of the Saxon *ac widu*, oak-wood. Oakham, Oakford, Oakenshaw, Oakley, etc., speak for themselves. In old Gaelic the oak was *daur*, in modern Gaelic the genitive *dara* or *darach* is used, but in Manx and Welsh it remains *dar*. Deer, Darroch and Darra are Scottish place-names retaining respectively the old and new form of the word, the latter often appearing in composition, as in Kildarroch, i.e.

coill darach, oak-wood. Still commoner is the derivative *doire*, originally *daire* (pronounced "derry"), signifying primarily an oak-wood, but later applied to woods in general. Hence the large class of names like Derry, Dirriemore, Derrynabrock, Derrynahinch, etc. St. Columba founded his monastery at a place called Daire-Calgaich in the year 546. Adamnan, writing a hundred years or so later, glossed this name *Roboretum Calgachi*, Calgach's oak-wood. After this it became Derry-Columkille, the oak-wood of Colum of the Churches, until finally James VI. and I. granted a charter thereof to a London company of traders, and the place became, and remains, known as Londonderry.

The mightiest oak I have seen of late years, at all events the oak which impressed me most forcibly with its mightiness, is one of the pedunculate kind near the mansion-house of Panshanger, Lord Desborough's place in Herts. It is figured in Strutt's *Sylva Britannica*; when he measured it in 1822 the girth was 19 feet at 3 feet from the ground, and its cubic contents were estimated at 1,000 feet. Elwes measured it in 1905 and found the girth to be 21 feet 4 inches at 5 feet. Following him in 1913, but without being aware of his measurement, I made the girth to be 21 feet 6 inches. This tree, however, is not likely to increase much in girth, unless it grows burrs, for it is stag-headed and past its prime. In this fine park of Panshanger I found two or three other oaks with a circumference of 21 feet, but none so impressive and majestic as the one aforesaid.

The Oak

"The oak," writes Mr. Elwes, "rarely attains in Scotland the size and vigour so commonly met with in England."[1] To that I make reply—"Give us time!" Scotland, her resources drained by three hundred years of all but incessant war which she had to wage in order to win and maintain her independence, became and remained a byword for poverty among the nations. Almost every shred of her woodland, once so vast, had been consumed before the end of the seventeenth century, so that Dr. Johnson was but drawing his bow a trifle too far when he vowed that in all his Scottish travel he had only seen two trees big enough to hang a man on. Practically no oaks were planted in Scotland until many years after the Union of Parliaments in 1707 had inaugurated an era of peace and security for north country lairds. "Give us time!" I repeat, and we shall produce oaks in Scotland that no English magnate would be ashamed to have in his park. Probably the tallest, if not the bulkiest oak that I have seen north of the Tweed, stands close to the mansion house of Blairdrummond in Perthshire. Elwes made it 118 feet high in 1906, with a girth of 17 feet at 5 feet from the ground and a clean bole of 24 feet.

Irish woodland suffered as disastrously as Scottish from reckless felling, but there can be no doubt about the size and quality of the oaks that grew in Ireland in the past. The roof timbers of Westminster Hall were grown in Shillelagh Forest, Co. Wicklow. These trees, no doubt, were of the sessile-flowered race, but

[1] *Trees of Great Britain and Ireland*, ii. 328.

the forest has entirely disappeared; and the great oak-wood at Abbeyleix, in Queen's County, is composed of pedunculate oaks.

Besides our British oak, there are between two and three hundred distinct species of *Quercus* in the Old and New Worlds, many of which are very beautiful trees, but not one whereof the timber approaches that of *Quercus robur* in quality. The foreign oak most commonly seen in these islands is the Turkey Oak (*Q. cerris*, Linn.), a native of southern Europe and Asia Minor, which grows to an immense size; it is invaluable as a shelter for more valuable growths, especially in maritime exposure, but for little else, as its timber, though very heavy, is said to be perishable, and certainly produces an excess of sap wood. "We shall say little," wrote John Evelyn, "of the *Cerris* or *Ægilops*, goodly to look on, but for little else." [1]

The ilex, or holm oak (*Quercus ilex*) is another tree which nobody need think of planting for profit, seeing that it produces timber of little value except for firing; nevertheless, it is one of the most ornamental trees that can be grown. Planted in the open, and given some attention in its youth to keep it to a single leader, it develops into a stately-domed mass of evergreen foliage, quite distinct in character from any other tree that flourishes in the British Isles. It would be sombre, did the leaves not glitter delightfully in sunlight; and in cloudy weather the wind sweeps up their white undersides and sets them all a-twinkle.

[1] *Sylva*, chap. iii. section 2.

The Oak

Although a native of the Mediterranean region, it adapts itself thoroughly to our climate, being perfectly hardy in all but the coldest parts of our country, and ripening its acorns plentifully in districts near the coast. Indeed, it is doubtful whether in its native region many loftier specimens can be found than one at Rossanagh, in County Wicklow, which, when I saw it in 1905, was 80 feet high. The tallest recorded by Mr. Elwes stands in the garden of the Hotel Hassler at Naples, measuring, in 1910, 90 feet high and 12½ feet in girth.

We commonly follow Roman usage in calling this tree "ilex," nor is it easy to understand why Linnæus appropriated this name for the holly, because Pliny plainly distinguishes between them, writing of the holly as "aquifolium." In English vernacular this oak was known as the holm oak, which is a corruption of hollen oak—*i.e.* the holly-like oak, because it is evergreen and the leaves of young plants are spined, though not so strongly as those of the holly.

Pliny has a great deal to say about this tree. He tells us that in the Vatican of Rome there was in his day an ilex older than the city, bearing a brazen plate inscribed with Etruscan characters, showing that it had been sacred of old. He also states that at Tivoli there were three holm oaks flourishing which were growing when Tivoli (Tibur) was founded centuries before Rome. Now, considering that Rome was founded about B.C. 750, and Pliny died about A.D. 115, it appears that the traditional age attributed to certain trees in his day was as liberal as it remains in

ours. It would not be rash, however, to venerate the splendid ilexes in the grounds of the Villa Pamfili and the Villa Borghese at Rome as lineal descendants of the trees that Pliny loved.

In suitable districts near the sea the ilex is invaluable as shelter. Once established, it stands the roughest buffeting of storms without disfigurement. I am writing these notes within a hundred yards of an ilex at Ardgowan, on the Clyde. It is about 50 feet high, and stands isolated on a bare lawn, exposed to all the fury of tempests that come roaring up the firth, twisting its boughs in the most violent manner. Yet these are so tough as never to be broken, and the tree remains a model of symmetry and grace.

At Holkham, in Norfolk, there is a large grove of ilex, called the Obelisk Wood, the like of which for extent is not to be seen, I think, elsewhere. At Tregothnan, in Cornwall, also an immense number of ilexes have been planted in a long avenue beside the sea. It is remarkable—unique, probably—but it is not an arrangement to be recommended for displaying the peculiar beauty of the trees, which consists in their massive foliage. The branches meet overhead, and as you drive along under them the effect is gloomy.

Very near of kin to the ilex is the cork oak (*Q. suber*), which grows all through the Spanish Peninsula and the Mediterranean region, except in those parts where limestone or chalk forms the soil. Of all the oak family, this comparatively humble member is of

most importance to civilised life, for no efficient substitute has been devised for cork in some of the uses to which it is put. The annual consumption must be enormous ; it is wonderful how the supply is maintained. Having no qualities to recommend it to the landscape gardener, the cork oak is only fit for growth in this country as a curiosity, and there only in the eastern and southern English counties. In the midland and northern districts it may exist, but cannot rightly thrive.

Many hybrids have been reared from the ilex. One of the choicest is Turner's oak (*Q. Turneri*), said to have originated in the Holloway Down Nursery, Essex, in 1795, as a cross between the ilex and the common English oak. It is of moderate stature, not greatly exceeding 50 feet, and is semi-evergreen, retaining its leaves, which are of a bright, rather light green, till February. The Lucombe oak (*Q. Lucombeana*) is also sub-evergreen, a hybrid between the ilex and the Turkey oak (*Q. cerris*), but is a much loftier tree than Turner's oak ; the foliage inclines in colour to the ilex, but the leaves approach those of the Turkey oak in form, the under surfaces being clothed with white down. This variety was raised about 1765 by William Lucombe, of Exeter.

Another remarkable hybrid, apparently between *Q. ilex* and *Q. cerris*, is the Fulham oak, of which the finest example I have seen in Scotland grows on the banks of the Ayr, in the grounds of Auchencruive.

Although these hybrid oaks ripen acorns, they cannot be relied on to produce exact counterparts of

their parents, the offspring of cross-bred seeds always tending to revert to one or other type in the cross.

Of the forty-seven North American species of oak enumerated by Sargent, none is to be desired by reason of the quality of its timber, which in every instance is inferior to that of our native species; but three, at least, have proved their value in this country as highly decorative trees, owing to the rich tints of the foliage in autumn. These are the red oak (*Q. rubra*), the scarlet oak (*Q. coccinea*) and the pin oak (*Q. palustris*). These are all trees of great stature, the pin oak having already exceeded 100 feet in height in England, presenting a gorgeous display when its leaves turn scarlet in the fall. In Scotland, however, the summer is not always warm enough to produce these fine colours; in wet, cold seasons the foliage remains green till the early frost blights it into brown.

Among oaks of the Old World, the Hungarian oak (*Q. conferta* syn. *pannonica*) and the Algerian oak (*Q. Mirbeckii*) are the most ornamental, and have proved amenable to British conditions. As a curiosity, a sheltered corner may be found for the Japanese *Quercus acuta*, a small evergreen tree with large laurel-like leaves, quite hardy, but apt to be broken by snow. In the absence of flowers or acorns, it would puzzle anyone to identify this tree as a member of the great clan of oaks.

The Beech

AMONG all the trees of British woodland none excels the beech in grace, vigour, and hardihood. It is not indigenous to Scotland; indeed, it is only in recent years that it has been recognised as a true native of southern Britain, its remains having been identified in post-tertiary beds at Southampton, Cromer, and some other places in East Anglia. Previous to that discovery, botanists had accepted Julius Caesar's assurance that the tree he called "fagus" did not grow in Britain (*Bellum Gallicum*, v. 12). But popular names for plants are never to be relied on, and although it is certain that Pliny (*Nat. Hist.* xvi. 6) described the beech under the name "fagus," it seems equally clear that Virgil (*Georgics*, ii. 71) applied it to the sweet chestnut. The confusion arose, no doubt, from the application of a Greek word signifying food to two species of tree very different from each other, but each producing edible fruit.

Although the beech (*Fagus sylvatica*, Linn.) cannot be reckoned as an aboriginal native of Scotland, it is long since it received letters of naturalisation in

that country, and has taken so kindly to the northern soil and climate that it may no longer be considered an alien. Indeed, it is in Scotland that the mightiest beech in the United Kingdom, perhaps in the world, is to be seen; not the loftiest, but one containing the largest amount of timber. This is the famous tree at Newbattle Abbey, near Dalkeith. Eighty years ago the indefatigable John Loudon measured it, and found it to be 88 feet high. In 1906 the equally indefatigable Mr. H. J. Elwes took its dimensions, and ascertained them to be as follows:

	Ft.	Ins.
Height - - - - - -	105	0
Girth of bole, at the ground - - -	43	8
Do., at 1 foot up - - -	37	0
Do., at 2½ feet up - - -	27	8
Do., at 3 feet up - - -	25	9½
Do., at 4 feet up - - -	23	1½
Do., at 4½ feet up - - -	21	11½
Do., at 5 feet up - - -	20	3½
Do., at 6 feet up - - -	19	7½

Truly an amazing edifice of sound timber; how long has it taken in the building? Normally, the beech is not long-lived compared with the oak, the yew, the Corsican pine, and some other trees grown in British woodland. Its "expectation of life" does not exceed 200 years. When it gets near that age it sometimes dies in a night, so to speak, expiring suddenly while apparently in full vigour. At other times it gets stag-headed, a sure sign of flagging vitality, and becomes infested with parasites, especially the felted beech-scale (*Cryptococcus fagi*), which administer the *coup de grâce.*

But the Newbattle beech is probably much more than 200 years old. Mr. Elwes estimates its age at 300 years. It has adopted a plan for prolonging its existence by allowing its great branches to droop to the ground, where seven of them have taken root, whence they have sprung up afresh and form a perfect grove still maintaining connection with the parent tree. Some of these subsidiary trees are already forty feet high and five feet in girth; and if, as is possible, they continue to contribute to the nourishment of their parent, the life of the original stem may be prolonged indefinitely.

There are at least three other beeches in Scotland taller than the Newbattle monster—namely, at Hopetoun House, at Blairdrummond, and at Methven Castle; but all of these must yield the palm to the Queen Beech at Ashridge Park, Hertfordshire. Mr. Elwes measured this tree in 1903, and "made it as nearly as possible to be 135 feet high (certainly over 130), and this is the greatest height I know any deciduous tree, except the elm, to have attained in Great Britain. Its girth was 12 feet 3 inches, and its bole straight and branchless for about 80 feet, so that its contents must be about 400 cubic feet to the first limb."[1] It may be noted in passing that elsewhere in his book Mr. Elwes has recorded certain deciduous trees even taller than the Queen Beech. For instance, on page 365 he mentions larches at Croft Castle, Herefordshire, 150 feet high; on page 873

[1] *The Trees of Great Britain and Ireland*, by H. J. Elwes and Augustine Henry, vol. i. p. 20.

QUEEN BEECH AT ASHRIDGE

REPRODUCED BY PERMISSION FROM *The Gardeners' Chronicle*

he records having measured an ash at Cobham Hall, Kent, 143 feet high, and on page 1820 the height of the black Italian poplar at Albury Park, Surrey, is estimated at 150 feet.

Beech timber is not held in high repute in the United Kingdom generally, being hard, brittle and perishable under weather exposure, although it is extremely durable under water. I have examined some of the beechen logs which were laid to strengthen the foundations of Winchester Cathedral in the extremely wet peat and shifty gravel which seam the site. For seven hundred years these logs have lain in the ground, faithfully fulfilling the function assigned to them of supporting the Lady Chapel erected by Bishop Godfrey de Lucy in the last few years of his life (he died in 1204), yet they are still perfectly hard and sound, having acquired with age a peculiar wan pearly hue.

In the north we reckon beechen slabs to be the best material for drain-tile soles in wet land. The timber is put to higher purpose in Buckinghamshire, where the extensive beech forests about High Wycombe and Newport Pagnell afford one of the few examples of systematic woodcraft in England. The trees are regularly grown and felled in rotation to supply the chairmaking industry, clean timber commanding, as it stands, a price of 1s. to 1s. 6d. a cubic foot. It has been asserted that the very name Buckingham is derived from the Anglo-Saxon *boc*, a beech; but it appears in the *Winchester Chronicle* as Buccingaham, which indicates its origin in a

family named Buccing, descended from an ancestor or chief called Bucca, the Buck. Howbeit, we are incessantly, though unconsciously, using the Anglo-Saxon *boc*, for it was smooth tablets or panels of beech that formed the primitive "book." In like manner crept in the term "leaves" of a book, because the foliage of *papyrus* preceded paper, which is the same word.

The beech is distinguished for three qualities beyond every other native of British woodland. First, by its abundant leaf-fall it promotes the formation of forest *humus*—the rich vegetable soil so essential to vigorous tree growth—more speedily and effectively than any other tree. Secondly, it bears shade better than any other broad-leaved tree; indeed, the only trees of any kind that approach it in this respect are the hornbeam and the silver fir. These two qualities make the beech best of all trees for under-planting; for, while the young beeches nourish the older trees by their leaf-fall and by checking evaporation from the soil, they are themselves preparing as a successional crop for the time when the old trees are ripe for felling. The third distinguishing quality of the beech is its unrivalled merit as firewood. None other throws out so much heat or burns so steadily; though it is a curious fact that the hornbeam, belonging to a different genus from the beech, mimics it in its foliage, is nearly as patient of overhead shade, produces timber closely resembling that of beech in appearance and quality, and, as fuel, yields very nearly as much heat.

The Beech

Besides the felted beech louse, *Cryptococcus fagi*, referred to above, the beech is liable to be attacked when young by the deadly fungus *Nectria ditissima*. The trees affected should be felled and burnt so soon as the canker characteristic of that plague manifests itself, for they never can recover. The singular disease called "beech-snap," which causes the stem to break off abruptly at 15 or 20 feet from the ground, is attributable to the fungus *Polyporus adustus*, though *Nectria* is generally present also on the trees affected.

The common beech has sported into many varieties. Those most commonly planted are the purple and copper beeches, which are far from being the same, as many people seem to think they are. A well-grown purple beech, such as that near the south-west corner of Osterley House, Isleworth (to name one out of very many fine specimens which exist in the United Kingdom), is a truly magnificent object, the rich, but subdued, depth of colour showing in charming contrast with other foliage, yet so soft as never to jar with it. This variety is said to have originated in a forest in the canton of Zurich, where, according to the legend, five brothers fought, three of whom fell, and from the soil where each lay grew a purple-leaved beech.

As for the copper beech, had I the chance of stopping the supply, I should not hesitate to do so, for the foliage, as I think, has a disagreeable metallic hue that consorts well with nothing else. Before purchasing young purple beeches, it is prudent to visit the nursery when they are in leaf, or you may

be served with copper beeches, and not discover the mistake till it is too late. The mast or seed of both purple and copper beeches yield a large proportion of seedlings in the parental livery; but no beech, green or purple, bears mast till it is at least forty years old.

The fern-leafed beech is no improvement on the type, and grows with the ungraceful pose of a grafted plant; but the weeping beech, which also has to be propagated by grafts, sometimes develops into an object of great beauty.

Of three or four exotic species of beech in the Northern Hemisphere there is but one, the American beech (*F. ferruginea*), which would be a gain to ornamental planting in the British Isles. Our own beech has a pretty bark, but that of the American species outshines it as silver does pewter. Unluckily, like many other growths of the Eastern States, it fails utterly to accommodate itself to the British climate. Visitors to Boston, Massachusetts, should not fail to see the group of beeches in the Arnold Arboretum at Brookline.

There are seventeen species of beech native of South America and Australasia. These have now been classified as a distinct genus, *Nothofagus*, that is, southern beech. Two of them appear to agree with British soil and climate, namely, the evergreen *N. betuloides*, whereof I have no experience, and the deciduous *N. obliqua*, of which two seedlings, raised from seed brought from Chile by Mr. Elwes in 1902, were sent me from Kew in 1906 to experiment on their

THE CHAIRMAKER, BUCKINGHAM BEECH WOODS

hardiness. These have grown vigorously, having endured 20° of frost without wincing, and are now [1914] about 20 feet high ; but, owing to their leafing fully a fortnight earlier than our native beech, they are more apt to be seared by late frost. In its native country this species equals our own beech in stature and bulk, its timber being largely used for railway sleepers, building, etc. Moreover, judging from the very few young plants in this country, it is an exceedingly ornamental tree. Of the other southern species, six are large evergreen trees, natives of Australia, New Zealand and Tasmania, not capable of enduring the British climate, except, perhaps, in the mildest districts of the south and west.

There are still, I believe, among the loyal subjects of King George V. persons who profess to be Jacobites, as there are undoubtedly thousands who cherish the memory of Prince Charles Edward as a precious national heritage. For these, the beeches that droop over the swift-running Arkaig at Lochiel's place of Achnacarry must have a mournful significance. In the spring of 1745, Donald Cameron of Lochiel, already advanced in years, was busy, in common with many other Scottish lairds, in developing the resources of his estates by draining, reclaiming, and planting trees. The union of the English and Scottish Legislatures had brought peace and security to the northern kingdom such as it had not known since the death of Alexander III. in 1286, and landowners felt encouraged for the first time to apply themselves to useful enterprise.

The Beech

Suddenly Prince Charlie landed at Borodale on 28th July, and summoned Lochiel and the other Highland chiefs to his standard. Lochiel, well knowing the hopelessness of the enterprise, started to obey the summons, thoroughly determined to dissuade the Prince from going forward with it. His brother, John Cameron of Fassifern, begged him not to meet the Prince. "For," said he, "I know you far better than you know yourself, and if the Prince once sets eyes upon you, he will make you do what he pleases." Fassifern was but too just in his forecast. It happened exactly as he had said. Lochiel at first flatly refused to bring out his clan; but in the end yielded to the Prince's persuasion, returned home, marshalled fourteen hundred men, and took part in all the phases of that hare-brained campaign, till he was carried off the field of Culloden severely wounded.

During Lochiel's absence a quantity of young beech trees had arrived at Achnacarry from the south to his order. They were heeled in a long row beside the river, awaiting his instructions. But the chief "came back to Lochaber no more." He lingered a couple of years in exile, his estates forfeited, his person proclaimed, and he died in 1748. The beeches were never removed from the trench where they had been set to await his return. They have grown up in a rank of silvery stems, so closely serried that between some of them a man's body may not pass. Winds of winter wail a coronach among the bare boughs; in summer the leafy branches stoop low upon the hurrying water; at the sunniest noontide there reigns

deep gloom under that crowded grove. No more pathetic memorial could be designed for a lost cause and for him whom men spoke of as "the gentle Lochiel."

The Spanish Chestnut

THE sweet or Spanish chestnut (*Castanea sativa*, Miller) cannot be reckoned indigenous to the British Isles, nor is there any evidence in support of the common belief that it was introduced during the Roman occupation. It is, however, far from improbable that the Roman colonists sowed some of the fruit which they imported as food, and, finding that the young trees took kindly to our soil and climate, continued to cultivate them.

Chestnuts, now as then, form an important part of the winter diet of country folk in Italy and Spain, being ground into flour, whence excellent cakes and pottage are made. British housewives regard them only as a luxury, and large quantities are imported into this country annually; but chestnuts are as nutritive and wholesome as they are palatable, and there are few more appetising odours than that wafted from the charcoal stove of the itinerant vendor of chestnuts, a familiar figure in London streets so soon as chill October draws to a close. I may confess to having partaken, under cloud of night, of this wayside delicacy; nor do I care

In Winter

SPANISH CHESTNUT

In Summer

how soon the opportunity presents itself of repeating the treat.

Chestnuts ripen well and regularly in the southern English counties, though they are considerably smaller than those imported from the Continent. In Scotland we seldom have enough summer heat to bring them to maturity. The summers of 1911 and 1914, indeed, were long enough and hot enough to ripen them; but even so the nuts were so small that there was more patience than profit in collecting them.

Even though we cannot actually trace the introduction of this noble tree to our Roman conquerors, there is proof in Anglo-Saxon literature that it was known in England before the Norman conquest, for it receives mention by an early writer as the "cisten" or "cyst-beam," "cisten" being but a form of the Latin *castanea*. Chaucer (1340-1400) is the earliest English poet to mention it, the list of trees wherein he includes it being a very interesting one as showing the nature of English woodland in the fourteenth century.

> As oke, firre, birche, aspe, elder, elme, poplere,
> Willow, holm,[1] plane,[2] boxe, chesten, laure,
> Maple, thorne, beche, awe, hasel, whipultre,[3]
> How they were felde shall not be tolde by me.

The right English name is, therefore, "chesten"; modern usage has added "nut," which is as irrational as it would be to speak of a "hazelnut" to indicate a hazel or a "fircone" to indicate a fir.

[1] Holly. [2] Sycamore. [3] Probably the ash.

Shakespeare, of course, was quite familiar both with the tree and its fruit. Thus one of the witches in *Macbeth*:

> A sailor's wife had chestnuts in her lap,
> And mounched and mounched and mounched.
> "Give me," quoth I.
> "Aroint thee, witch!" the rump-fed ronyon cries.

Moreover, the chestnut had been long enough established in England to have its name borrowed to denote a rich shade of russet. So in *As You Like It*:

> *Rosalind.* I' faith, his hair is of a good colour.
> *Celia.* An excellent colour; your chestnut was ever the only colour.

The Spanish chestnut is essentially a southern growth, being found wild only in Southern Europe, Algeria, Asia Minor, and Northern Persia. It is remarkable, therefore, that it should thrive so well in the British Isles, even in the northern part thereof; for although, as aforesaid, it is shy of fruiting in Scotland, it grows to enormous proportions in that country.

Probably the tallest chestnut north of the Tweed is one at Yester, in East Lothian, which in 1908 measured 112 feet high by 18 feet 8 inches in girth. Next to it comes a fine tree at Marchmont, in Berwickshire, 102 feet high by 14½ in girth, with a clear bole of 32 feet. Still further north, there is a huge fellow at Castle Leod, in Ross-shire, which, though only 76 feet high, girths no less than 21 feet 4 inches at 5 feet from the ground.

The Spanish Chestnut

The finest chestnut I have seen anywhere is in the woodland of Thoresby Park, near Nottingham, being within the bounds of the ancient Sherwood Forest. In 1904 it was 110 feet high, with a straight bole quite clear of branches for 70 feet. Its cubic contents in timber were estimated at 300 feet. Loudon measured this tree in 1837 and found it to be 70 feet high, with a girth of only 11 feet at 1 foot from the ground. Its girth at that height is now over 17 feet. It is impossible to imagine a more perfect specimen of the species than this beautiful tree. It was planted about the year 1730, and is, therefore, now, say, 180 years old. Planters may accept a lesson from this tree, which has been drawn up to its fine stature by being grown in close forest among beeches, some of which, of the same height as itself, have been cleared away to show its fine proportions. Without such discipline, it might have expended its vigour in building up an enormously swollen trunk, instead of towering to its present height.

This tendency towards breadth instead of height may be seen in countless places, both in England and Scotland. The Trysting Tree at Bemersyde, the massive pair in Mr. Wallace's garden at Lochryan, and the great chestnut at Myres Castle, in Fife (19 feet 9 inches in girth), are examples in point. At Deepdene, in Surrey, there stands a tree of this character, the clear bole being only 8 feet high, but girthing 26½ feet *at the narrowest part.* Near to it is one of nobler proportions—90 feet high, with a girth of 21 feet 5 inches.

The Spanish Chestnut

There is one characteristic of the chestnut which, while it adds much to the beauty of the grove, certainly detracts from the value of the timber. Just as one may see in a Gothic cloister how the architect, wearying of straight columns, introduces here and there a twisted one, so the trunk of the chestnut often grows in a regularly spiral manner.

Economically and commercially, the timber of Spanish chestnut, up to a certain age, is no whit inferior to that of the oak—superior, indeed, in its young stages, owing to its producing less sap wood. Chestnut palings, gates, etc., are the most durable that can be made of any British-grown wood. In 1907 Lord Ducie exhibited at the Gloucestershire Agricultural Show some fencing posts made from chestnuts which he planted in 1855 and felled in 1885. These posts remained perfectly sound after exposure to wind and weather for two and twenty years.

Not only in durability, but in other qualities, the timber of chestnut is fully equal to that of oak, which it closely resembles; and, as it grows much faster and to a larger size than the oak, it would soon drive its rival out of the market, but for its greater liability to one grave defect, namely, "ring-shake." This is the name given to a splitting of the wood along one of the concentric annual rings, thereby ruining the log for the sawing of planks. The cause of this internal rupture is obscure, but the injury takes place in chestnuts over seventy years of age more commonly than in any other tree, and, as it cannot be

detected until the tree is felled, merchants are very shy of offering for a standing lot.

As a coppice tree, the Spanish chestnut has no equal in this country; the rotation of the crop is far shorter than that of oak, the poles are more durable, and a steady demand has been created for an admirable form of paling made up of split chestnut staves, set closely together upright and bound with wire. This kind of fence, however, ought not to be used in any fox-hunting country, for high-couraged hounds, attempting to climb it, get impaled on the sharp tops and frightfully injured.

"Chestnut," it is well known, is uncomplimentary slang for a worn-out anecdote. They told me in Philadelphia that the phrase had its source in a theatre in Walnut Street, one of the principal thoroughfares of that city. This theatre was built in rivalry of an older one in Chestnut Street: its *répertoire* lacked originality, and patrons of the other house, when they recognised jokes they had heard and situations they had seen there, used to hail the players with the cry—"A chestnut! a chestnut!" And this explanation may serve as well as another. In this connection I may be permitted to put on record a *bon mot* by a well-known member of the present Radical Government. We had been dining, a small party, in the House of Commons, shortly after the late Sir M. Grant Duff had published the third volume of his reminiscences, which, it may be remembered, contained many anecdotes not told for the first time. One of the ladies of our party expressed a wish to see

Westminster Hall, and, having been conducted thither, asked me what the fine roof was made of. "It is of oak," I replied; "some people used to think it was of chestnuts, but I don't suppose there were enough chestnuts in England to furnish a roof like that in the reign of Richard." "No," observed Mr. ———, "Grant Duff had not published his third volume!"

The Ash

"Oh it's hame and it's hame, at hame I fain would be,
Hame, lads, hame in the north countrie;
Oh the oak and the ash and the bonny ivy tree,
They a' flourish best in the north countrie."

THE bard who was responsible for this ancient jingle assigned that precedence to the oak which common sentiment has always accorded to it as the monarch of British woodland. Economically, also, the oak held the first place so long as Britannia ruled the waves from wooden walls, but in this ironclad era our Admiralty has little use for oak timber, and there is now no broad-leaved or "hardwood" tree that can be cultivated so profitably as the ash. Indeed it is hardly doubtful that this is the only species of tree, willows, poplars and certain conifers excepted, which a young man may plant with reasonable expectation of receiving any pecuniary profit during his lifetime. The properties which ensure to the ash (*Fraxinus excelsior*) this superiority to all rivals are its hardihood, the matchless quality of its timber for many purposes, and its market value from a very early age.

The Ash

First, as to its hardihood. No British tree, not even the oak, is so wary of starting into growth before all risk of late spring frost is past. Tennyson, the very Virgil among British bards for keen observation of nature, has embalmed this characteristic in a beautiful passage in *The Princess* :

> Why lingereth she to clothe herself in love ?
> Delaying, as the tender ash delays
> To clothe herself when all the woods are green.

Once, and once only, do I remember the prudent ash to have been caught, namely, in 1897, when after a month of deceptive warmth, the mercury fell to 10° Fahrenheit on the 22nd May. Twenty-two degrees of frost within a month of the summer solstice ! No wonder the young ash foliage, which had been lured into precocious growth, was shrivelled and blackened as by fire. And that, not only in the north, but in Herts and Hants, as I had occasion to note when trout-fishing in these southern counties. Even the beech and hawthorn fared no better, but their leaves were seared brown instead of black.

Then as to wind exposure, what tree can compare with the ash for length and strength of anchorage against the gale ? It is astonishing to what distance it sends its tough roots, whether they run through free soil or wind themselves into the crevices of limestone rock. This far-ranging habit renders it the worst of all neighbours to a garden, and no ash tree should be suffered to grow within fifty yards of ground where herbs or fruit are cultivated.

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MANNA ASH (*Fraxinus ornus*)
AT WAKEHURST PLACE

The Ash

For toughness and strength the timber of ash has no equal, even among foreign woods ; and it is always in request at a good price for waggon-building, implement-making, and other purposes. Moreover, British ash, properly grown, is more highly esteemed than ash imported from other countries. Unfortunately, owing to our neglect of systematic and economic forestry, as distinct from arboriculture and the management of game covert, ash is very seldom to be seen grown under proper conditions in the United Kingdom. It should be grown in woods sufficiently close to draw the stems up to such a height as will ensure a good length of clean bole. Standing in the open or in hedgerows, it sends out huge side branches which destroy the quality of the timber.

In consequence of our misuse of this tree, which ought to be the most valuable of all assets to British forestry, good ash timber has become exceedingly scarce ; although undoubtedly there are an immense number of excellent stems in most parts of the country, which, if landowners generally understood their own interest and the true welfare of their woodland, would be felled and sold before they reached an unmanageable size.

In one respect the ash possesses a merit superior to any other hardwood tree, except, as aforesaid, willow and poplar, in that it reaches commercial maturity soonest. Grown under forest conditions in good, well-drained soil, it is most fit for the market at from fifty to seventy years of age. But, as it is readily saleable from twenty years old upwards, an

ash plantation may be reckoned on bringing in some revenue from thinnings long before the main crop is ripe for the axe. For instance, I was lately offered a very good price for ash poles averaging nine inches in diameter for the manufacture of billiard cues. The regular supply is drawn from Switzerland ; but could most easily be furnished from British woodland if the necessary care were bestowed upon the saplings. The trees should not be allowed to stand after attaining eighty years of growth ; for the timber, even if it continued sound, hardens after that age, and, losing much of its characteristic elasticity, does not command such a good price.

Homer says that the spear of Achilles had an ashen shaft, and all true Scots should hold the ash in special honour, forasmuch as of yore it furnished staves for their national weapon, the pike. It was from the long ashen pike-shafts of Randolph Moray's handful of Scots that de Clifford's cavalry recoiled on the Eve of St. John, 1314, after thrice attempting to break that bristling fence of steel ; it was through the staunchness of his pikemen that next day, on the slopes of Bannockburn, Edward Bruce was able to bear the brunt of attack by the English columns, hurl them into unutterable ruin among the Milton bogs, and so set seal, once for all, to Scottish independence and freedom.

It was probably owing to the high value that the Scots had learnt to set upon ash timber, both for military and domestic use, that this tree was more commonly planted than any other in compliance with the statute of James II. (fourteenth Parliament,

cap. 80), requiring every landowner to cause his tenants to plant and maintain trees in number proportioned to the extent of their holdings. This was in 1424; in 1573 it was re-enacted, along with "sindrie louabil and gud Acts," by 6 James vi. c. 84; whereof the effect may still be traced in the landscape of many parts of Scotland in the shape of old ash trees standing round farmhouses and other homesteads. Often, where two or more farms have been thrown into one, the trees remain long after the disused buildings have been removed.

Belief in the medicinal virtues of the ash was very general in early times, probably derived from the Orient, where the manna ash (*F. ornus*) abounds. Yet Pliny, who recognised the difference between the two species, not only recommended extract of the common ash as a draught to cure snake-bites and as superior to any other remedy when applied to ulcers, but solemnly affirms that he has himself proved that if ash leaves are laid in a circle round a snake and a fire, the snake will crawl into the fire rather than touch the leaves. Even sage John Evelyn recommended ash extract to cure deafness, toothache and other ailments, and, later still, Gilbert White of Selborne describes the superstitious practice of passing sickly children through the stems of ash-trees, split for that purpose, in the belief that, if the clefts grew together again after the wedges were removed, the patients would recover. For household purposes, ash provides excellent firewood, which burns as well green as dry.

The Ash

The tallest ash measured by Mr. H. J. Elwes in 1907, stood 146 feet high, and was 12 feet 7 inches in girth 5 feet from the ground. This fine tree is growing with many others of about equal height in Lord Darnley's park at Cobham, in Kent. The tallest ash recorded in Scotland was one at Mount Stuart, in the Island of Bute, stated to have been 134 feet high in 1879; but this has now disappeared. The loftiest certified by Messrs. Elwes and Henry as still standing is a great tree at Dalswinton, in Dumfriesshire, which, in 1904, stood 110 feet high, with a girth of only 8 feet 3 inches. Sir Archibald Buchan-Hepburn, however, claims to have one at Smeaton Hepburn measuring 124 feet in height and 11 feet in girth in 1908.

Weeping ashes have rather gone out of vogue, but they are very pretty things if the sport is grafted on a sufficiently high stem and the stock be not suffered to outgrow the graft, as it will do if not attended to. By far the most successful example of this kind of freak tree is the one at Elvaston Castle, near Derby, 98 feet high with branches hanging to a length of 60 or 70 feet, a truly remarkable object, and beautiful withal, as may be seen from the fine plate in Messrs. Elwes and Henry's book. Although its requirement of a deep, cool and generous soil render the ash unsuitable for London conditions, yet there are a few handsome weeping ashes in that city, notably one at the south-west corner of Bedford Square.

Like all our indigenous trees, the ash has impressed itself upon our place-names. Ashby, Ashton, Ash-

ridge, Ascot—the map of England is peppered freely with such names; that of Scotland more sparsely, owing to the preponderance of Gaelic in the topography. The Gael employed several forms of his name for the ash, namely, *fuinnse*, *fuinnsean*, and *fuinnseog* (pronounced funsha, funshan, and funshog), whence many names in southern and western Ireland such as Funcheon, a river in Cork, Funshin, and Funshinagh several times in Connaught. But the initial consonant soon dropped off, and in northern Ireland and among the Scottish Gaels the word became *uinnse* (inshy) preserved in the name Inshaw Hill (Wigtownshire), Killyminshaw (Dumfriesshire), etc.; or *uinnseog* (inshog), recognisable in Inshock (Forfar), Inshaig (Argyll), Inshog (Nairn), Drumnaminshoch and Knockninshock (Kirkcudbright). The plural *uinnsean* (inshan) has assumed a very grotesque form in Wigtownshire, where there are two farms twenty miles apart named Inshanks.

Liability to disease is an important consideration in regard to forest trees, and the ash has the merit of being remarkably free from ailments. The worst malady from which it is liable to suffer seriously is known as ash canker, whereby the timber is rendered worthless except for firing. Happily it does not seem very contagious; for I have known badly cankered trees standing for twenty years and more without imparting the disease to their healthy neighbours. The late Dr. Masters attributed the mischief to the work of the larva of a small moth (*Tinea curtisella*). That creature may start the injury, but

it is certainly taken up and aggravated by the fungoid organism *Nectria ditissima*. Although, as aforesaid, the disease does not appear to be readily communicable to healthy trees, it is not advisable to leave the unsightly invalids standing. The sooner they are cut down and burnt the better.

There are between fifty and sixty exotic species of ash, but among them there is only one known to me as specially desirable for ornamental planting, namely, the Manna Ash (*Fraxinus ornus*), producing a profusion of creamy-white plumes of blossom in June. This pretty tree is the source of the manna of commerce, a sweet and mildly laxative substance obtained by tapping the stem in late summer and allowing the sap which flows from the wound to coagulate.

Manna of various sorts is collected from many different kinds of plant; that which supported the Israelites in the desert is supposed to have been an exudation from the tamarisk; but Sicilian manna is the only kind that is recognised as an article of European trade. In Sicily the manna ash is planted in *frassinetti* or ash-yards, grown for eight years and regularly tapped, till the main stem is exhausted, when it is cut down, and a fresh growth is allowed to spring from the root. The active principle in manna is mannite, a hexatomic alcohol, chemically expressed as $C_6H_8(OH_6)$. The manna ash is not often seen in this country; those specimens which are of any size are invariably grafted plants; but a stock is easily raised from seed, which Continental nurserymen

readily supply. In Dalmatia and Montenegro, where this tree abounds, drivers stick the flowers thereof in the harness of their horses to keep off flies, which dislike the peculiar odour. A Chinese species (*F. Mariesii*) is near of kin to *F. ornus*, and is said to bear flowers of superior beauty to that tree; but of this I can only write from hearsay.

The Linden Tree or Lime

WHEN we speak of a lime tree we conform to a corrupt usage, for the right English name is "line" or "linden tree," linden being the adjectival form of the Anglo-Saxon "lind," just as "asp" and "oak" give the adjectives "aspen" and "oaken." The late Professor Skeat, foremost authority in English etymology, observed that "the change from 'line' to 'lime' does not seem to be older than about A.D. 1700"; but he overlooked the use of the modern form by John Evelyn, who, in his *Sylva* (1664), writes always of "the lime tree or linden," showing that the change had taken place between his day and Shakespeare's.

> *Prospero.* . . . . . Say, my spirit,
> How fares the King and his?
> *Ariel.* Confin'd together
> In the same fashion as you gave in charge;
> Just as you left them, sir; all prisoners
> In the line grove which weather-fends your cell.
> (*Tempest*, Act v. sc. 1.)

The root meaning of the word is "smooth," referring to the texture of the timber, which caused it of old

COMMON LIME (*Tilia vulgaris*)

to be in great request for making shields, so that in Anglo-Saxon *lind* meant a shield, as well as being the name of the tree.

It is strange that Tennyson, so sensitive to delicacy of sound, should have used the modern form in his frequent mention of the tree. Only one instance comes to mind of his preferring the more musical dissyllable. When Amphion set the forest dancing—

> The *Linden* broke her ranks and rent
> The woodbine wreaths that bind her,
> And down the middle—buzz! she went,
> With all her bees behind her.

The limes form a somewhat perplexing family, inasmuch as, of the score or so of species recognised by botanists, several cannot be reputed as more than hybrids or sports. The only species claimed as indigenous to Britain is the small-leaved lime (*Tilia cordata*), and even about this botanists are not of a certain mind. For instance, the joint authors of *The Trees of Great Britain and Ireland* have formed different opinions, Dr. Henry considering it to be "a native of England, ranging from Cumberland southward," while Mr. Elwes fails to reconcile this with the facts that no fossil remains of this tree have been identified in the British Isles, and that he has never been able to find, or to find anybody else who has found, a self-sown seedling.

There are many fine specimens of the small-leaved lime in England, ranging from 80 to 110 feet high; but it has never been known to attain the dimensions of the common lime (*T. europœa*), which, although it

The Linden Tree or Lime

is an exotic species, has made itself thoroughly at home between the Straits of Dover and the Moray Firth, and is the tree which those who do not scrupulously discriminate regard as *the* lime tree *par excellence.*

It would require much space to mention all the notable limes in our country, for they were very extensively planted 200 or 300 years ago, and, being long-lived, many of them have grown to great size. Mr. Elwes gives the palm to the lime grove at Ashridge, Lord Brownlow's fine park in Hertfordshire. These trees were planted in 1660, and average 120 feet in height and 10 feet in girth. They have been grown in a close row, only 12 to 15 feet apart, and have thereby escaped the defects to which limes are so prone as ornamental trees—namely, spreading to ungainly breadth instead of rising to height, and covering their trunks with an unsightly mass of brush.

At Knole Park, in Kent, advantage has been taken of this spreading habit to allow the formation of a very remarkable grove. The parent tree was described by Loudon as covering a quarter of an acre in 1820; the boughs have drooped so as to root themselves, and have risen again, forming trees 80 and 90 feet high, which in their turn have repeated the process, forming a second circle of trees 20 to 40 feet high, and these again are engaged in forming a third concentric circle, the total diameter of the grove, all connected with the central stem, being 36 yards. The great lime at Gordon Castle, known as the Duchess's Tree, has behaved in a similar way; but,

FLOWER OF THE LINDEN TREE (*Tilia Europæa*)

as the supplementary growths have not been trained into trees as at Knole, the whole forms a dense thicket, impenetrable save where a passage has been kept clear to the interior. A tree of this description covers almost enough ground, if not for a small holding, at least for an allotment, for the total circumference of this mass of branches is 480 feet or 160 yards.

It is as an avenue tree that the lime is seen at its best, disputing pre-eminence for that purpose with the beech. Moreover, although the beech must be accounted the more beautiful tree, its rival has advantage over it in the delicious fragrance of its blossom, which is produced in great profusion, powerfully attractive to bees. Strange to say, although the fragrant flowers are of a pale yellowish, greenish white, the honey extracted from them is deep brown, darker than heather honey, and of inferior flavour.

Fine avenues of limes are innumerable in Britain, many of them being over 200 years old. At Newhouse Park, Devon, Mr. Elwes describes a remarkable one, which was planted about 200 years ago as an approach to a house which never was built. The rows are only 20 feet apart, and the trees, which are only 10 feet apart in the rows, have risen to an immense height, averaging over 120 feet.

Among other notable lime avenues may be noted those at Stratton Park, Hants (Lord Northbrook's); Cassiobury, Herts (Lord Essex's), said to have been planted by Le Notre, the designer of the gardens at Versailles; at Braxted Park, Essex (Mr. Du Cane's), composed of three rows on each side; at Wollaton

Hall, Notts, and Birdsall, Yorks (both places belonging to Lord Middleton). In all these avenues the trees range from 120 to 130 feet high; but none can compete in length with an avenue planted at Clumber by the Duke of Newcastle in 1840, which is only 200 yards short of two miles long. Unfortunately, these trees were planted far too wide apart in the rows, 31 feet from tree to tree, and, having been afterwards neglected in the matter of training, have squandered their luxuriance in bushy growth. To form a fine avenue timely pruning is indispensable.

The lime, being more tolerant than the beech of drought, parching heat and a smoky atmosphere, thrives vigorously in towns of moderate size, and also in large cities where the chief fuel is not coal. The well-known thoroughfare, Unter-den-Linden, in Berlin, corresponds to the Mall in London. I have not identified the species with which it is planted; certainly of late years they have been planting in Berlin a natural hybrid known as the smooth-leaved lime (*T. euchlora*), which has the merit of keeping its glossy foliage later in autumn than the common lime. The trees in Unter-den-Linden are remarkable neither for size nor vigour, but they provide grateful shade and verdure in summer.

The atmosphere of Berlin is certainly not so hurtful to tree growth as that of London, where poplars, planes, ailanthus, and acacia (*Robinia*) are practically the only forest trees that can do battle successfully with the parching heat and stifling fogs of that city; conditions which the limes that used

WEEPING WHITE LIME (*Tilia petiolaris*)
At Wakehurst Place

to stand in the Mall resented by casting their foliage in disgust before August was sped. The limes in the Cathedral close of Winchester afford an example of felicitous association of foliage with noble architecture. Perhaps there is a remembrance of them in Tennyson's *Gardener's Daughter* :—

> Over many a range
> Of waning lime the gray cathedral towers,
> Across a hazy glimmer of the west,
> Reveal'd their shining windows.

The smooth white timber of lime was once in much more request than it is now. Pliny praises it as worm-proof and useful, describing how the inner bark was woven into ropes, as it now is into bast for the mats with which gardeners protect their frames from frost. These mats are chiefly made in and exported from Russia. Lime timber, being less liable to split than other woods, was the favourite material for wood-carving; indeed, Evelyn writes of it as being used exclusively in their work :—

"Because of its colour and easy working, and that it is not subject to split, architects make with it models for their designed buildings; and the carvers in wood use it, not only for small figures, but for large statues and entire histories in bass and high relieve; witness, beside several more, the festoons, fruitages, and other sculptures of admirable invention and performance to be seen about the choir of St. Paul's and other churches, Royal Palaces, and noble houses in city and country; all of them the works and invention of our Lysippus, Mr. [Grinling] Gibbons, comparable, and for aught appears equal, to anything of the antients. Having had the honour (for so I account it) to be the first who recommended this great artist to His Majesty Charles II., I mention it on this occasion with much satisfaction."

The Linden Tree or Lime

It is owing to the neglect of British planters and the consequent irregularity of the home timber trade that this fine timber has been ousted from its former pre-eminence by imports of other kinds.

In writing of the common lime, I have used the scientific name, *Tilia Europœa* as conferred on it by Linnæus, rather than the more recent title of *T. vulgaris*. There seems a special reason for retaining the old name, inasmuch as Linnæus considered his own family name was derived from the linden tree.

ENGLISH ELM (*Ulmus campestris*)

The Elms

IT is a matter of doubtful argument how many species go to compose the genus Elm—*Ulmus*—owing to the uncertainty of distinguishing true permanent species from varieties and natural hybrids. Foremost botanists have differed widely on the question; for whereas Bentham and Hooker recognised in 1887 only two true species growing naturally in the United Kingdom, Elwes and Henry describe five native species, besides nine varieties of the wych elm, as many of the English elm, and no fewer than thirteen varieties of *Ulmus nitens*, a species hitherto classed as a form of the English elm.

The distribution of the elm family is somewhat peculiar, extending all the way from Japan, through Northern China and Europe to North America, but not crossing to the Western States; nor is any species to be found south of the temperate zone, except in the mountain ranges of Southern Mexico. Of all the cities of the New World, Boston reminds the British traveller more vividly of home scenes than any other, by reason of the massive English elms which enrich the landscape. Pity it is that we cannot

return the compliment by planting the beautiful white elm (*Ulmus Americana*), the glory of Washington city, for it does not take kindly to our island climate.

The elm with which we are most familiar in the North is the wych elm (*U. montana*), easily to be distinguished from the English elm by the fact that it throws up no suckers from the root, whereas the English elm hardly ever ripens seed, and propagates itself entirely by suckers which it sends out as colonists to an astonishing distance—50 yards and more. There are exceedingly few authentic records of the English elm ripening seed in Great Britain; on the other hand, the wych elm sometimes produces a prodigious crop. In the spring of 1909 this tree presented a curious appearance. The foregoing summer had been a very warm one, stimulating the wych elm to such extraordinary efforts at reproduction that, before the leaves appeared, the trees seemed to be covered with fresh young foliage, which was really the crowded leaf-like seed vessels. In June these leaf-like membranes had become dry scales, each acting as parachute to a single seed, so that, under a hot sun and a high wind, the air was full of them—so full that they actually choked the eave-gutters of my house. Each of these little monoplanes carried the potentiality of a majestic forest tree; given a suitable resting-place, any one of these minute seeds might develop into an elm like those at Darnaway, in Morayshire, which in 1882 were 95 feet high, with clean boles up to 24 feet. So great was the exhaustion following upon the

WYCH ELM (*Ulmus montana*)

abnormal seed crop of 1909 that some of my elms were crippled by it, and two or three died outright.[1]

To produce well-shaped wych elms, timely pruning is essential, followed by close forest treatment, for no other tree spreads more wildly and wantonly, and unless means are taken to keep a single leader on each, the result will be very different from those lordly examples which stood, not many years ago, on the banks of the White Cart at Pollok, four of which were figured by Strutt in his *Sylva Britannica* in 1824. The largest of these measured in that year 85 feet in height and 11 feet 10 inches in girth, and contained 669 cubic feet of timber. Two of this group were blown down in the great gale of 22nd December, 1894, and the remaining pair were felled in 1905, being respectively 90 and 96 feet high. The age of these giants was shown by the annual rings to be about 300 years.

The weeping elms which one sometimes sees in gardens is a variety which originated in a Perthshire nursery about one hundred years ago. It is very ornamental, though it never attains much height, being perfectly flat-topped. As it can only be propagated by grafts, a sharp lookout must be kept to prevent the stock outgrowing the scion.

The wych elm is indigenous over the whole of the northern part of Great Britain, the largest recorded being at Studley Royal, in Yorkshire—105 feet high and 23 feet in girth at 5 feet up in 1905. As an

[1] The summer of 1914 was noted for a similar abundance of seed on the wych elm.

element of the primæval Scottish forest, the wych elm must have been held in high esteem, judging from the number of Gaelic place-names commemorating it. The old Gaelic name for it was *leam*, plural *leaman* (pronounced "lam" and "lamman"). Ptolemy's *Leamanonius Lacus* is now Loch Lomond, the lake of elms, out of which flows the Leven, which is the more modern aspirated form *leamhan* (pronounced "lavan"); and we find the same association of names in eastern Scotland, where the Lomond Hills overlook the town of Leven. The Lennox district was formerly written Levenax, which is the adjectival form *leamhnach* (lavnah), an elm wood. The rivers Lune and Leven in Lancashire (Ptolemy's Alauna), the Leven in Cumberland, and the Laune at Killarney all seem to indicate the former existence of elm woods on their banks. In the name Carlaverock is probably preserved another derivative—*caer leamhraich*, the fort among the elms.

It was long supposed that the English elm (*U. campestris*) was not indigenous to England, seeing that it never propagates itself in these islands by seed. Its presence was explained by the convenient device of attributing its introduction to the Romans; but there is not a shred of evidence in support of this conjecture. The elm of Italy is quite a distinct species, according to Elwes and Henry, a fact with which Shakespeare, though familiar with "Warwickshire weeds" (as elms are called near Stratford-on-Avon), may not have been acquainted when he made Adriana plead with him she believed to be her husband:

Come, I will fasten on this sleeve of thine ;
Thou art an elm, my husband, I a vine ;
Whose weakness, married to thy stronger state,
Makes me with thy strength to communicate.

The English elm, however, grows luxuriantly in Spain, and ripens seed abundantly there, the tradition being current that it was introduced from England to the Royal Park at Aranjuez when Philip II. was laying out that demesne. Dr. Henry, however, considers it not improbable that this tree is truly indigenous in Spain, and that it is certainly so in the southern counties of England, where, as aforesaid, it reproduces itself only by suckers. Other examples are not wanting of certain plants yielding to climatic conditions, by resorting to reproduction by suckers and ceasing to produce seed.

Perhaps the most striking display of the true English elm to be found anywhere is the magnificent quadruple avenue known as the Long Walk, at Windsor. Many of these are 120 feet high and 15 feet in girth. The avenue leads from the Castle gates to the statue in the park, a distance of two miles and three-quarters. Taller individual elms may be seen elsewhere, as in the grounds of King's College, Cambridge (130 feet), Boreham House, in Essex (132 feet), and Northampton Court, Gloucestershire (150 feet by 20 feet in girth). The last-named tree, by the way, may no longer be seen, for it was blown down in 1895, but there can be no doubt about its dimensions, which were accurately ascertained as it lay on the ground. It was probably the champion of that

particular species in England; but it was inferior in bulk to the great elm which stood in the grounds of Magdalen College, Oxford, until it was blown down in April, 1911, pronounced by Mr. Elwes to be "the largest elm I have ever seen and the largest tree of any kind in Great Britain."[1] Mr. Elwes carefully measured the fallen giant, finding it to be 142 feet high, 27 feet in girth, and containing 2787 cubic feet of timber. He and Dr. Henry pronounce it to have belonged to the variety or sub-species classed as the smooth-leaved Huntingdon or Chichester elm (*U. vegeta*, Lindley), although in this case no suckers had been produced, which the Huntingdon elm usually sends up in profusion.

It is usually stated in forestry manuals that the English elm is not suited for Scottish conditions. My own experience is directly opposed to that view, for, having some score or so of these trees now about 110 years old to compare with wych elms planted at the same time, the English species exceeds the other in height and equals it in bulk. Two English elms at Loudon Castle, in Ayrshire, were measured in 1908, and were found respectively to be 107 feet by 15 feet 4 inches and 105 feet by 16 feet 4 inches.

I have found, however, that by far the shapeliest and best elm for Scottish planting is the smooth-leaved elm, formerly, and probably correctly, considered to be merely a permanent variety of the English elm (*U. campestris*), but now distinguished as a species under the title of *Ulmus nitens*. It cer-

[1] *Trees of Great Britain and Ireland*, p. 1881.

THE GREAT ELM AT MAGDALEN COLLEGE, OXFORD

tainly resists violent winds better than the English elm, being therefore preferable for sea exposure. Moreover, its timber is esteemed more highly than that of other elms, being remarkably tough. Dr. Henry has distinguished a variety of this elm as *Italica*—the Mediterranean elm—which is the kind used by Tuscan vine-dressers to train their vines on.

The smooth-leaved elm is of less sprawling habit than the wych elm, but occasionally it takes advantage of space to spread out of all measure. Of this there is an example at Sharpham, near Totnes, where a tree of this species has covered the space of a quarter of an acre, some of its side branches being 104 feet long. The total height was between 80 and 90 feet in 1906, in which year it was figured in the *Gardener's Chronicle* as a wych elm. Mr. Elwes, however, pronounces it to be of the smooth-leaved kind. On the other hand, the Cornish elm, which is a variety of *U. nitens*, is usually of columnar habit.

The Sycamore and other Maples

"Put forth thy leaf, thou lofty plane,
East wind and frost are safely gone;
While zephyr mild and balmy rain
The summer comes serenely on."

A NORTH countryman, reading Clough's beautiful lines, is pretty sure to apply them to the wrong tree, because, when a Scots forester speaks of a plane tree, he is understood to mean what in the south is called a sycamore. But even that is a misnomer, the true sycamore, mentioned in Holy Writ, being a fig-tree (*Ficus sycamorus*).

The sycamore and the plane are quite distinct, belonging to separate natural orders, the sycamore being a maple (*Aceraceæ*), the largest of all the maples, and the plane constituting a single group in the order *Platanaceæ*. The confusion of names has arisen from the success with which the sycamore masquerades as a plane, imitating its foliage and aping it in its habit of shedding the bark in thin flakes. Botanists have given recognition to this peculiarity by the scientific title they have conferred on the sycamore, viz. *Acer pseudo-platanus*, or the false plane. But in

SYCAMORE (*Acer pseudo-platanus*)
IN SUMMER

its flower and fruit the sycamore cannot disguise its true affinity. Its flowers are arranged in triplets on long hanging scapes, of a yellowish green, only requiring a dash of brighter hue to render the sycamore one of the loveliest objects in the spring woodland. The flowers are followed by fruits which stamp the tree unmistakably as a maple. The seed-vessels are composed of what in botany are termed *samaræ* or keys, each containing a large seed or two. These samaræ are attached to each other in pairs, and, as each carries a beautifully-formed membranous wing, the result is a pair of wings to each pair of seed-vessels, securing wide distribution of the seeds by autumnal winds. On the other hand, the flowers of the true plane (*Platanus*) are very minute, and the fruit consists of a mass of thin seeds set among closely-pressed hairs and bristles, forming a hard, perfectly round ball nearly an inch in diameter. These balls, from two to six on each fruiting stalk, hang conspicuously on the branches all winter, until the dry March winds burst them and allow the seeds to float away.

Neither sycamore nor plane are natives of the United Kingdom. The plane, though it excels all other trees for planting in smoky towns like London, does not take kindly to the cooler atmosphere of Scotland and northern England. Not so the sycamore, which, although naturally a product of the mountain ranges of Central and Southern Europe, nowhere flourishes more freely and sows itself more abundantly than in North Britain. Indeed, it is a conspicuous

instance of the careless prodigality of Nature how thickly every bare spot in a wood becomes covered with seedling sycamores, not one in a million of which have the faintest chance of surviving two or three seasons.

The life period of the sycamore is a long one, probably three times that of the beech and equal to that of the oak. At Truns, in the Swiss Oberland, a great sycamore, already in ruin, was destroyed by a storm in 1870. As it was under this tree that the Grey League, originators of the canton of Grisons, took the oath in 1424, it can scarcely have been less than 600 years old when it ceased to exist. Mr. Elwes gives the dimensions of another mighty sycamore in Switzerland, growing at an elevation of more than 4000 feet in the canton of Unterwalden, which must be coeval with the tree of the Grey League. It measures 29 feet in circumference at 5 feet from the ground. We cannot quite equal that in Scotland, although in that country and northern England there are some enormous sycamores. Behind the Birnam Hotel stand two very large trees, an oak and a sycamore. The oak, lesser of the two, is shown to visitors as the last survivor of that forest whereof it was said

> Macbeth shall never vanquished be
> Until great Birnam wood to high Dunsinane hill
> Shall come against him.

The other is a giant sycamore, reported in Hunter's *Woods and Forests of Perthshire* (1883) to be one thousand years old, which, of course, is impossible. I measured the girth of this great tree in 1903, and

SYCAMORE
In Winter

made it 19 feet 8 inches at 5 feet from the ground. It was not until long after that I found that Hunter had given exactly the same measurement twenty years earlier. This girth is exceeded by one at Castle Menzies, which, in 1904, gave 20 feet 4 inches. The loftiest sycamore reported in Scotland is also in Perthshire, at Blair Drummond. This tree Dr. Henry ascertained to be 108 feet high, with a girth of 10 feet.

At Kippenross, also in Perthshire, there remain fragments of a sycamore destroyed by lightning in 1860. It was known in the seventeenth century as "the Muckle Tree o' Kippenross," and was estimated in 1821 to contain 875 cubic feet of timber.

It would be vain to attempt within reasonable limits of space to give a catalogue of the notable sycamores in Great Britain. Most of the finest specimens are in Scotland; for no tree can be planted in our northern land with greater security of success; it fears neither severe frost nor reasonable wind exposure; but it insists upon well-drained soil. In damp, low-lying ground it may appear to flourish; but in such a situation it is sure to prove "boss" (to use a term in Scottish forestry) or hollow at the heart when ready for the axe. In England there are many sycamores of 100 feet and upwards; but this tree has become much more closely identified with the landscape of the northern counties than with that of the south.

As a forest tree, the sycamore has been treated with unmerited neglect by British planters; though it is not singular in that respect, so improvidently have

we accustomed ourselves to rely upon foreign supplies. We ought to bestow more care upon our sycamores, because not only is it a tree that rapidly re-establishes itself by seed and is practically immune from disease, but it produces timber which, when of sufficient size, commands a higher price than any other British-grown wood. That size is not less than 18 inches quarter girth, representing sixty to eighty years' growth, and from that size up to any dimensions, provided that the bole is straight, clean-grown and free of knots. The main purpose for which such stems are in demand is for making large rollers used in calico and wallpaper printing, in washing machines and cotton dyeing. A few years ago I was shown a single sycamore growing at Makerstoun on Tweedside for which the owner had been offered, and refused, £50. The wood is also in good request for railway carriage panelling, furniture, dairy utensils, etc.

As an ornamental tree it must be owned that the sycamore does not take high rank, owing to the monotonous tone assumed by its massive foliage after the flush of spring has passed. Nor does it usually compound for this by splendour of autumnal colour, as so many of the maple family do. Indeed, this is one of the qualities of its near kindred which the sycamore has discarded in order, it would almost seem, to simulate the plane more perfectly and to justify its appellation of "the false plane"; for the foliage of the plane falls like that of the sycamore without any dying brilliancy. It is true, however, that old sycamores, when sheltered from sea winds,

FRUIT OF SYCAMORE (*Acer pseudo-platanus*)

do sometimes assume bright tones of yellow and orange in autumn. At Keir, in Perthshire, a row of aged trees of this species surprised me by their brilliancy in November, 1913.

Although, as I have said, the sycamore is remarkably free from disease and from serious fungoid or insect attacks, it is the host of a parasitic fungus which seldom fails to make its presence apparent, though without perceptibly affecting the growth or health of the tree. Readers must be very familiar with the circular black spots which appear on the leaves about midsummer and continue till they fall. It is not a few leaves or a few trees here and there that are so affected, but all the leaves on large trees and on every tree in the wood. The difficulty is to find a leaf without these black spots; so that people have come to regard them as part of the regular colour scheme of the foliage. Nevertheless, each of these blots is a colony of the parasitic fungus, *Rhytisma*, whereof the life-history is still subject for investigation. It is not evident how the colonies are regularly distributed, each clear of the other, all over the leaves of a lofty tree, nor how, seeing that they fall to the ground with the leaves in autumn, the fungus manages to get access in the following summer to the loftiest branches. It is lucky that, being so widely distributed and existing in such incalculable numbers, these colonies do not appreciably interfere with the natural functions of the sycamore.

The only native species of maple in Britain is the Field Maple (*Acer campestre*), which does not extend

naturally into either Scotland or Ireland, though it grows freely in both these countries when planted in either of these countries. It is a very ancient element in the woodland of south Britain, its remains having been identified in pre-glacial beds in Suffolk. It has no qualities to recommend it for ornamental planting, and the timber, once highly prized by British cabinet-makers, has been ousted from the home-market by imported foreign woods. When the Rev. William Gilpin, author of a well-known work on *Forest Scenery*, died in 1804, he was buried, it is said, at the foot of a field maple growing in his own churchyard at Boldre, in the New Forest. Strutt gave a figure of this tree which he described as the largest of the species in England; but he gives the height as only 45 feet, whereas Elwes records several from 60 to 70 feet high.

A far more desirable tree than the field maple is the Norway maple (*A. platanoides*, Linn.). The title "Norway" no more indicates its natural range than the term "Scots" does that of *Pinus sylvestris*, for this maple is found in most European countries and as far east as Persia and the Caucasus. It is a beautiful tree, especially in autumn, when its foliage takes on brilliant red and yellow hues; but it requires attention during the first twenty or thirty years of growth, in order to check its disposition to a straggling branchy habit. If that be stopped by timely pruning, the Norway maple grows straight and free, attaining, under favourable conditions, a height of 80 to 90 feet. Its timber has not the ornamental character of that

of field maple, but is said to be of similar quality to that of sycamore. The petioles or leaf-stalks of this species contain a milky juice, whereby the tree may be distinguished from all other members of the genus.

Now, whereas botanists enumerate no fewer than one hundred and ten species of maple, natives of Europe, Asia and America, it would be impossible within the limits of this modest volume to discuss even the most desirable of the genus. Among the North American species there are several that grow to splendid dimensions in their native forest. One of the most distinct is the red maple (*A. rubrum*), a beautiful object in spring when it bears flowers profusely, which, in some varieties, are of a charming red colour. There are a few specimens in England of the well-known sugar maple (*A. saccharum*), but it seldom thrives in this country, though it has been frequently tried since its introduction, according to Loudon, in 1735.

The Plane

AMONG Scottish foresters the name "plane-tree" has come to signify the sycamore; but the sycamore is a kind of maple, whereas the term "plane" is rightly appropriated to *Platanus*, whereof there are four species, constituting the natural order of *Platanaceæ*. Of these four species, three are natives of North America; and forasmuch as none of them has proved amenable to cultivation in Europe, they may be dismissed with the remark that one of them, the button-wood (*P. occidentalis*), attains enormous proportions in its native forests, rising to a height of 170 feet, and with a girth (recorded by Michaux) of 47 feet.

The fourth species (*P. orientalis*) ranks among the noblest hardwoods of temperate Europe and Asia. Clear among memories of many sylvan scenes stand a pair of giant planes on the flank of Mount Olympus, in the leafless branches of which on a bright January morning a pair of white-tailed eagles monopolised the attention which I was intended by my Turkish host to devote to woodcocks in the copse below. Those who have sailed along the Dalmatian coast

will doubtless remember the harbour of Gravosa, and the solitary plane that casts such a grateful shade across the quay. But one need not go to the Continent for giant planes. In our day it is one of the trees most commonly planted in the southern counties for shade and ornament, and has no equal for the smoke-laden atmosphere of London. It may be that it was one of Evelyn's seedlings that Bishop Gunning planted in his Garden at Ely between 1674 and 1684. This tree in 1903 was 104 feet high, with a girth of 20½ feet. Messrs. Elwes and Henry give a photograph of it in their *Trees of Great Britain and Ireland*, and consider it to be the largest specimen in our islands of the cut-leaved variety.

Turner, writing in 1562, mentions "two very young trees" growing in England, which indicates the middle of the sixteenth century as the period of its introduction. A hundred years later, Evelyn says he has raised from seed—

> "*Platanus*, that so beautiful and precious tree so doated on by Xerxes that Ælian and other authors tell us he made halt and stop'd his prodigious army of seventeen hundred thousand soldiers to admire the pulchritude and procerity of one of these goodly trees, and became so fond of it that he cover'd it with gold gemms, necklaces, scarfs and bracelets, and infinite riches."

The maple-leaved variety, usually known as the London plane, is the sort most commonly planted in England, and rightly so, for it is more vigorous than the other. Probably the tallest in England grows at Woolbeding, in Sussex; it was 110 feet high in 1903, with a girth of 10 feet, and a clean bole of 30 feet. It

would be needless to enumerate the fine planes in and near London; one has only to look at the groups beside the Admiralty and in Berkeley Square to realise how it thrives in an atmosphere pernicious to nearly all other forest growths. Fifty or sixty years hence the avenue of planes planted not long since along the Mall will be one of the sights of Europe. The skilful way in which they are being trained each to a single leader gives them a stiff, ungraceful appearance at present; but this treatment is a bit of true arboriculture, carried out in the teeth of bitter criticism. "Bairns and fules shouldna see things half dune."

It is the absence of the conditions specially favourable to the growth of the plane in London and the south that makes it unsuitable for planting in the North of England and in Scotland. It is native to a region of scorching summers; in London the sun's heat is reflected from buildings and streets in a manner most acceptable to it. It will stand any amount of frost it may encounter in Scotland; but it pines for want of summer heat, witness the unhappy condition of those which have been planted experimentally along the west end of Princes Street, Edinburgh. I do not know of a single plane of more than mediocre stature north of the Tweed.

The plane is nearly as late in leafing as the ash and the walnut, thereby escaping the cruel frosts so characteristic of British spring; but unlike the ash, it retains its foliage into very late autumn. Pliny described an evergreen plane growing in Crete; but

after the botanist Tournefort (1656-1708) had searched the island in vain for it, this was relegated to the category of myths. Howbeit, tardy justice was done to Pliny as the prince of field naturalists, when in 1865 Captain Spratt, R.N., was shown two young plane trees, retaining their leaves throughout the winter, which had sprung from the root of a very large tree that had been felled. He also heard of two others.

The Oriental plane has not been long enough established with us to give an estimate of its longevity in Britain. In the Mediterranean region it attains a vast age. Only a hollow stump remains of one at Vostiza, in the Gulf of Lepanto, which in 1842 was about 130 feet high and 37 feet 4 inches in girth, and was believed to be the tree described by Pausanias when writing his description of Greece in the second century after Christ. Neither have we learnt to make much use of the timber so plentifully produced by the plane, though it is said to be second to none for the bodies of carriages.

In antiquity of descent the plane tree has few, if any, superiors among broad-leaved trees, its remains having been recovered from the Cretaceous beds of North America, besides numerous species recovered from Miocene and Tertiary strata, in Northern Europe, whence they were expelled when that region became icebound.

The London planes have been accused of being chief agents in inflicting influenza, bronchitis and catarrh upon the inhabitants of the metropolis. It

has been seriously affirmed that when the seed-vessels of the plane break up in dry spring weather, the air is filled with minute spicules which act as an irritant upon human throats and noses. It may be so; but before condemning the trees, without which London would indeed be desolate, it would be well to ascertain first whether the ailments referred to are more prevalent in London during the months when the plane tree is shedding its dry fruit than they are at other times of the year; and second, whether they are more prevalent in London, where there is wealth of planes, than they are in cities where there are no planes, as Edinburgh, Glasgow, Liverpool, Newcastle, etc. Unless this can be shown to be the case, it is difficult to reconcile the fact that London has the lowest death-rate among the cities of the United Kingdom with any mischief arising from the luxuriance of these beautiful trees.

HORSE CHESTNUT (*Æsculus hippocastanum*) IN BLOOM

HORSE CHESTNUT FLOWER SPIKE

The Horse Chestnut

IN one respect the horse chestnut (*Æsculus hippocastanum*) may be reckoned among the most remarkable trees of British woodland, inasmuch as, although it has been found in a wild state only here and there among the mountains of Greece and Albania, where it enjoys a climate widely dissimilar from that of Western Europe, it has a constitution so cosmopolitan as to become thoroughly at home in all parts of our country. It thrives as vigorously on the dry chalk soil of Hertfordshire as on the soaked hillsides of Perthshire, and, given reasonable shelter from violent winds, produces its magnificent foliage and flowers as freely near sea level as it does at Invercauld in Aberdeenshire, where there is, or was not long ago, a fair specimen growing at an elevation of 1,110 feet, not far short of the practical limit of tree growth in Scotland. In 1864 this horse chestnut was 8 feet 7 inches in girth, and was believed to have been planted in the year 1687; therefore, if it still stands, it is now 226 years old.

Another sign of the adaptability of the horse chestnut to British environment is the freedom with

which it ripens its large fruit and reproduces itself from self-sown seed wherever it gets a chance. The facility with which it does so has caused this tree to be deemed indigenous in many parts of Europe and Asia where it certainly is not a native, but where it has been planted originally on account of its beauty. Further confusion has arisen from the botanists Linnæus and De Candolle having failed to distinguish the Indian horse chestnut (*Æ. indica*) from the Greek species, and having assigned Northern Asia as the native region of the latter.

It would not be difficult to mention many individual horse chestnuts in the British Isles exceeding 100 feet in height; probably this tree, if subjected to forest conditions, would grow far loftier than that; but, as it is usually planted exclusively for ornament, it is most often found standing isolated, thereby receiving encouragement to develop enormous side branches and to grow in breadth and bulk rather than in height. Such is the character of a great horse chestnut standing in a group near Moncrieff House, Perthshire. In 1883 this tree measured no less than 19 feet in girth at 5 feet from the ground; but at 10 feet it divides into three huge limbs, each girthing 10 feet, and covers a space nearly 100 yards in circumference. The soil in this district is cool and the climate humid, very different from the conditions at Ashridge in Hertfordshire, where the soil is chalky and hot; yet there is in that fine park a horse chestnut even more massive than the Moncrieff House specimen, being about 80 feet high, and measuring 20

feet in girth. Probably the loftiest horse chestnut in Britain, perhaps in the world, is one at Petworth, in Sussex, which, having been drawn up in close forest, now measures between 115 and 120 feet in height.

It is a pity that this noble tree does not more often receive encouragement to upward growth, seeing that if the surrounding trees are cleared away judiciously, that is not too suddenly, after the horse chestnut has reached a good height, it then feathers down in the most charming manner. It is very seldom that, without discipline of this kind, it will put its energy into height, and attain the fine proportions of a specimen at Biel, in East Lothian. In 1884 this grand tree, probably the loftiest in Scotland, measured 102 feet in height, with a clean bole of 40 feet. It is worth any amount of trouble to secure this character in the horse chestnut, which is an inveterate spreader if allowed licence; and the tendency may be checked by knocking side buds off the stem in the sapling stage, and timely pruning as the tree goes on to maturity.

As an avenue tree, the horse chestnut has few, if any, superiors. Perhaps the finest examples in Scotland of this manner of planting it are to be seen at Gilmerton, in East Lothian, and Drummond Castle, in Perthshire; while in England the splendid double avenue at Bushey Park, Middlesex, has long been famous, "Chestnut Sunday" being a noted festival for Londoners when the trees are in full bloom. The horse chestnut, however, is not a long-lived tree, and cannot be reckoned upon to survive beyond 250

years. The Bushey Park chestnuts are failing fast, many having died already and been replaced by saplings.

Talking of avenues, it is worth while to note a calamity described by Mr. Hutchison of Carlowrie in the Transactions of the Highland and Agricultural Society for 1884. He states there that in 1867 an avenue of horse chestnuts was planted as an approach to the cemetery of Wimborne, Dorsetshire, the trees being set 25 feet apart in the rows. In 1875 it was thought to improve the avenue by planting yews in the intervals between the chestnuts, which had this unfortunate result, that the chestnuts, which had previously thriven finely, all pined away and died.

It is on record that the horse chestnut was first brought to France in 1615, and probably found its way into England about the same time. It seems that it was expected to rank with walnuts and Spanish chestnuts as a fruit tree, a notion which was speedily dispelled. John Evelyn, however, with a right taste for sylvan beauty, early discerned its decorative merit, writing about it in 1663 as follows :

> "In the meantime I wish we did more universally propagate the horse chestnut, which being increased from layers, grows into a goodly standard, and bears a glorious flower, even in our cold country. This tree is now all the mode for the avenues to their country places in France."

Travellers in that fair land will remember with pleasure the fine use still made of this tree beside some of the high roads. Between Tours and Blois the wayside has been planted with a chestnut unknown

to Evelyn, for it did not exist anywhere in his day. This is the red horse chestnut (*Æsculus carnea*), which seems to have originated in Germany about the beginning of the nineteenth century, and is believed to be a hybrid between *Æ. hippocastanum* and the North American shrub *Æ. pavia.* It is a most beautiful tree, the flowers being of a delightful shade of bright carmine. We are told not to expect it to attain the stature of the common horse chestnut, so it would be well, in designing an avenue, not to mix the red and the white with a view to matching them in height; but the red hybrid has already risen to 50 feet high at Barton in Sussex, and I entertain an idea that this tree may develop into larger proportions than is expected of it, when planted in good soil and favouring shelter. At all events, some which I planted about thirty years ago are now quite as large as common horse chestnuts of the same age.

Mr. Elwes recommends the horse chestnut for planting in towns, remarking that "next to the plane it is one of the best trees we have for this purpose, and does not seem to suffer much from smoke." I regret that I am unable to endorse this view. It is true that in towns of moderate size, and in country villages, horse chestnuts may be planted with excellent effect. I know of few more charming sights than is presented by the group of these trees in the high street of Esher when they are in flower; but in London horse chestnuts prove a lamentable failure. Living as I used to do in the neighbourhood of Sloane Street, it was a distress to me each year to watch the

stunted, round-headed chestnuts in the gardens at the lower part of that thoroughfare, and in Eaton Square, unfolding their delicate fingers only to have them parched and blackened by the ruthless drought and dirt of the Metropolis.

As a timber producer, the horse chestnut cannot be assigned high rank. There is no lack of quantity, for the tree increases very rapidly in bulk, but in quality the wood is soft, weak, and very perishable. Moreover, it is almost useless as fuel, and probably the only economic purpose to which it could be applied profitably is the production of wood-pulp and celluloid.

The true meaning of the prefix "horse," by which this tree is distinguished from the true or Spanish chestnut, has been the subject of much discussion. Apparently it was not applied in the sense of "coarse, large," as in the terms horse-radish, horse-mushroom, etc., for the Turkish name for it is *at kastan*, signifying horse-chestnut; and this was explained in a letter written by the Flemish Dr. Quackleben to Matthiolus in 1557 (many years before the tree was known in Britain), explaining the use of the fruit as a specific against broken wind in horses.

ASPEN TREE (*Populus tremula*)

The Poplars

"Hard by a poplar shook alway,
All silver green with gnarled bark;
For leagues no other tree did mark
The level waste, the rounding gray."

THERE is much confusion among the different species of poplar, but it is clear that in these verses Tennyson had in view our native abele or grey poplar (*Populus canescens*), a native of Great Britain, often mistaken for the white poplar (*P. alba*), which nearly resembles the grey, and has been planted in this country, but is probably an exotic. The poet's epithet "silver green" admirably describes the foliage of the grey poplar, for some of the shoots bear green leaves, others white ones, others again green leaves on the lower part and white on the upper.

Of all known species of poplar, thirty or so in number, the abele produces the choicest timber, much in request by carriage-builders, who sometimes pay as much as 2s. 6d. a cubic foot for well-grown logs. It is excellent timber for flooring bedrooms, being

less inflammable than any other British-grown wood except larch. It is, therefore, characteristic of British neglect of woodland resources that this tree is hardly ever planted, though it is most easily propagated from suckers or cuttings, and attains an immense size long before an oak could reach maturity.

The abele is more common in Scotland than in England, and many large trees might be mentioned in the North. It would be difficult, however, to find any to surpass two growing at Mauldslie Castle, in Clydesdale, one of which in 1911 measured 100 feet high and 21 feet 3 inches in girth, the other 117 feet by 16 feet 5 inches. It should be noted that the girth of both was taken at between 2 and 3 feet from the ground, instead of 5 feet, which is the proper height for measurement.

Next in economic importance to the grey poplar stands what is popularly known in this country as the black Italian poplar (*P. serotina*), which is not Italian in any sense, but a hybrid originating in France (where it is called *peuplier suisse*) between an American species and the true black poplar (*P. nigra*). This confusion of names is all the more perplexing because the upright variety of the true black poplar goes by the name of Lombardy poplar. However, one must use the names most generally recognised among woodmen, and the black Italian poplar is well worthy of more attention than it has hitherto received in this country, for it produces valuable timber in greater bulk in a short term of years than any other British-grown tree. Mr. Elwes

has recorded how thirty poplars of this variety, planted on cold clay in Gloucestershire, not worth 5s. an acre, were sold for £3 apiece at forty-eight years of age. He lays stress on the importance of giving this tree plenty of room at all stages of growth, planting them at 15 to 20 feet apart, for the timber is little worth unless the tree gets enough light to enable it to produce wood rapidly. This precept applies to every species of poplar.

The tallest black Italian poplar in Great Britain is probably one growing on the banks of the Tillingbourne, in Albury Park, Surrey, which in 1912 measured 150 feet high, with a girth of 15 feet 3 inches. There are many fine specimens in Scotland, notably one at Scone Palace, which in 1904 was 132 feet high, with a girth of 15 feet 4 inches. Another at Monzie, in Perthshire, measured at the same time, stood 125 feet high.

Turning now to the true black poplar (*Populus nigra*), we find that this species, a native of Midland England, but probably not of Scotland, has become established in the eastern United States, having been introduced there by British colonists. It has often been confused with the black Italian variety, but may easily be distinguished in this country by the large burrs on the trunk, by its earlier leafing, and by the young foliage being green, instead of reddish, as in the black Italian. The true black poplar also sheds its leaves much earlier in autumn than does the other. It is not a tree commonly planted in Scotland, but there are specimens ranging from 90 to 100 feet high

at Dalzell, Ross, and Cambusnethan, in Lanarkshire; at Auchentorlie, on the Clyde; and at Smeaton-Hepburn, in East Lothian.

The variety of this tree so well known as the Lombardy poplar forms a notable feature in the landscapes of Southern England, Central and Southern Europe, and a great part of Asia. As it can only be propagated by cuttings, it is believed that all the millions of Lombardy poplars spread over the continents of Europe and Asia originated with a single "sport" growing on the bank of the river Po early in the eighteenth century. Probably the first of its race was brought to England about 1750 by the third Duke of Argyll, and planted by him at Whitton, near Hounslow. This tree, which has now disappeared, was measured by Loudon before 1838 as 115 feet high.

One peculiarity of the Lombardy poplar I do not remember to have seen noticed by any writer on forestry. Other poplars of all sorts, including the black poplar whereof this is only a variety, mingle branches freely with their neighbours; but the Lombardy poplar is a regular *Sainte-Nitouche*, and will not suffer contact with any other tree, even one of its own race. A curious example of this may be seen in London. When the Buckingham Palace Hotel was built, somewhere about 1860, Queen Victoria desired that a screen of trees should be planted within the Palace enclosure to shut the hotel out of view. The Office of Works chose the Lombardy poplar, calculating that it would form a lofty, thick hedge. Not a bit of it! The trees died rather than touch each other;

In July — WHITE POPLAR (*Populus alba*) — In December

they have been replaced times without number; but the Office of Works has never discerned the secret of their temperament, and continue their task of Sisyphus year after year, filling the gaps caused by death with trees of the same kind. Had a row of true planes been set there at first, the privacy of the Palace would have been secured long before this.

Despite this constant characteristic of the Lombardy poplar, which anybody may verify for himself by examining the fine groups of them near Maidenhead and Windsor, Selby committed himself to the extraordinary statement that this tree, "planted so as to form a hedge, and being cut even at a certain height and regularly trimmed, becomes a thick and verdant hedge."[1]

The asp (*Populus tremula*) is now generally spoken of by the adjectival form "aspen." Its ceaseless movement earned it the name of "quick-beam" in Anglo-Saxon, and the Lowland Scots name, "quakin' asp" (corrupted into "quakin' ash") has, so far, survived the operations of School Boards. Long may it do so! The same characteristic in this tree gave it the Gaelic name of *crithean* (creean) or *criothach* (creeagh), "the trembler," which may be recognised in such place-names as Creechan in Dumfriesshire and, perhaps, Crieff, in Perthshire. Although in bulk and stature one of the humbler members of the poplar family, the asp exhibits in an extreme form a peculiarity common to all the genus—namely, that of hanging the leaves vertically, instead of holding them

[1] *British Forest Trees*, 1842, p. 208.

horizontally. The leaves are glandular on both surfaces, which may be either the effect of or the reason for their assuming a position protecting both surfaces from the direct rays of the sun. To secure this position, the petiole, or foot stalk, of each leaf, being cylindrical in most of its length, is suddenly flattened midway between the leaf and the twig, as if it had been pinched while soft. This causes the leaf to hang as described, and to quiver with the slightest breath of air.

The asp is a hardy mountaineer; its graceful foliage and *eau-de-Nile* bark saves many a Highland hillside from dreariness, but it has long ceased to have the economic importance it once had. By an Act of the English Parliament (4 Henry V. c. 3), a penalty of 100 shillings was imposed upon anyone who put aspen wood to any other purpose than the making of arrows. Mrs. Hemans has woven into verse the mediæval myth which taught men to reckon this pretty tree accursed:

> Oh! a cause more deep,
> More solemn far, the rustic doth assign
> To the strange restlessness of those wan leaves.
> The cross, he deems, the blessed cross whereon
> The meek Redeemer bowed His head to death,
> Was formed of aspen wood; and since that hour
> Through all its race the pale tree hath sent down
> A thrilling consciousness, a secret awe,
> Making them tremulous, when not a breeze
> Disturbs the airy thistle-down, or shakes
> The light lines of the shining gossamer.

Gerard, writing in the sixteenth century, says, with scant gallantry, that the asp "may also be

In Summer

In Winter

LOMBARDY POPLAR

called *tremble* after the French name, considering it is the matter whereof women's toongs were made, which seldom cease wagging."

Professor Sargent enumerates eleven species of poplar as indigenous to North America, some of which, such as the Balsam poplar (*P. balsamifera*), the Ontario poplar (*P. candicans*), and the Carolina poplar (*P. angulata*), have risen to large dimensions in British woodland; but to follow out these, and their constantly recurring hybrids, would far exceed the limits of this paper.

There are many Asiatic species also, one of which (*P. euphratica*) we are now taught to recognise as the "arabim" whereon the captive Jews hung their harps (Psalm cxxxvii. 2). The weeping willow, named by Linnæus *Babylonica*, is not found in the valley of the Euphrates.

It is time that British planters should recognise the importance of the more vigorous species of poplar as rapid timber-producers, thriving in cold, wet ground where no other crop could be raised so successfully. A useful example is set in this matter by French cultivators, who plant more poplars than any other tree. Moreover, all the species are most easily propagated and handled in planting. They should be grown from cuttings; it is futile to attempt raising them from seed—a most uncertain process, and unsatisfactory when it succeeds, cutting-grown plants being far more vigorous than seedlings.

The Birch

BENTHAM and Hooker recognised only two species of birch as indigenous to the British Isles—namely, *Betula alba*, the common birch, and *B. nana*, an insignificant shrub which grows in the Scottish Highlands. Messrs. Elwes and Henry, however, in their great work give specific rank to each of the two forms of the common birch prevailing in this country. It is certainly strange that the difference between them has not received more attention from foresters, seeing that one is a far more valuable tree than the other. Whether they be permanent species or merely racial varieties matters not for practical purposes; but it matters much that the better kind be planted where conditions are favourable for it.

The commoner and less desirable of the two forms has been named *B. pubescens*, owing to the young shoots being clothed with down, sometimes so minute as to require a lens to show it. This and the habit of the tree are the only constant marks of distinction from the other form, which is named *B. verrucosa*, because the shoots, though shining and

perfectly free from down, are studded with minute *verrucæ*, or warts, easily discernible by the naked eye. I have found in southern Norway, where the two reputed species grow together, intermediate forms which are no doubt natural hybrids.

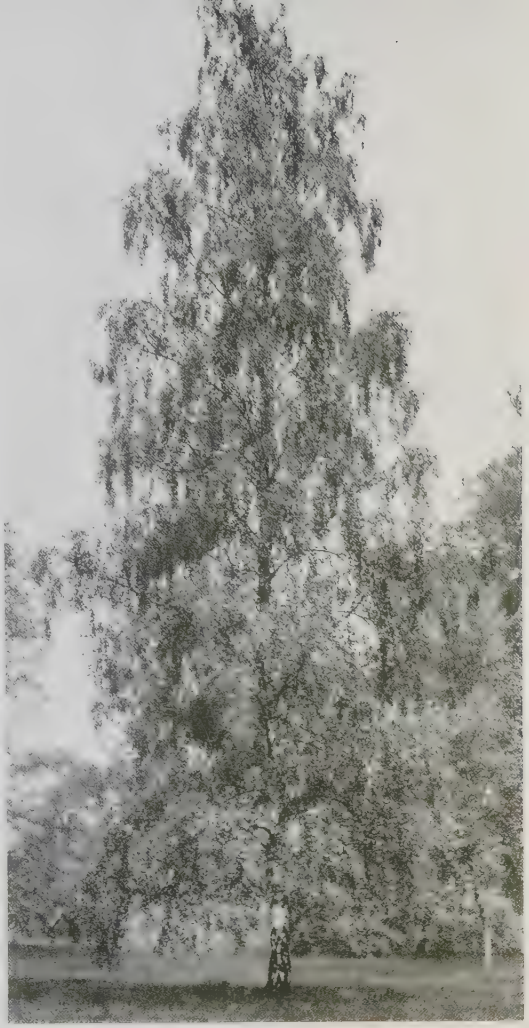
The two species are usually quite different in habit, the common birch (*B. pubescens*) never carrying the long pendulous branchlets which distinguish the silver birch (*B. verrucosa*). Moreover, the common birch does not usually attain the stature of the other, although Mr. Elwes mentions having measured one at Malborough 90 feet high, with a girth of 8 feet. This is the species which grows naturally over the greater part of Scotland, especially in the west and north. The distinctive downiness of the young twigs may have had its origin in the humid atmosphere and abundant rainfall of the regions where it most abounds. Geographically it enjoys a very wide range, extending farther north than any other tree—as far as latitude 71° near the North Cape—and reappearing in Iceland and southern Greenland, far within the limit of floating ice. Eastward it extends as far as Kamschatka, but it does not reach southward beyond the Alps, not being found in the Pyrenees or the Apennines, whereas the silver birch reaches down to Sicily.

Coming to the north-east of Scotland, to Strathspey, Deeside, and part of the basin of the Moray Firth, one finds a change in the aspect of the birch forest; for here, although the common birch still prevails on the wetter parts, the silver birch is dominant

on the drained land and hill sides. It is there that the lady of the woods displays her true grace and it is hard to say whether she is more lovely in summer, when she waves her long green tresses in the breeze, or in winter, when the slanting sunbeams glint on the snowy stem, and the drooping branchlets appear like fine tracery against the sky. This is the true weeping birch so highly prized by landscape gardeners, and this is the species that should always be chosen for planting, provided the land is well drained, for it cannot stand damp feet with the same impunity as its cousin. The general rule is not difficult to remember that, whereas the common or downy birch will grow on almost any soil that is not actual swamp, the silver or weeping birch is very impatient of stagnant moisture.

Beautiful as are the birch woods of Strathspey (travellers to the North must have been charmed with those on both sides of the railway near Lochinsch Station), it must be confessed that the silver birch does not attain its greatest perfection in Great Britain. Individual trees may be found to compare pretty well with those in Continental woods; but the general average is not so good. I have not seen the birch forests of the Baltic provinces and Central Russia; those who have done so speak enthusiastically of them; but it is from no want of loyalty to the Birks of Aberfeldy that I have to admit that their bark has not the sheen nor their growth the free grace of their kindred in French, German, and Scandinavian forests.

Inseparably associated as the birch is with Scottish



In June — BIRCH (*Betula alba verrucosa*) — In December

landscape, poets and painters have never wearied of honouring it. The late David MacWhirter got its beauty rather on the brain, and one turned rather tired of what became a mannerism in his work. Hamilton of Bangour never rang his quaintly iterative changes so tenderly as in his ballad, *The Braes of Yarrow*, the tragedy of a maiden with two lovers. The lovers fight, and one falls—

> The comliest swain
> That e'er pu'd birks on the braes o' Yarrow.

The survivor presses his court, trying in vain to persuade the girl to leave Tweedside and come to his home beside Yarrow.

> Sweet smells the birk, green grows, green grows the grass—
> Yellow on Yarrow's braes the gowan;
> Fair hangs the apple frae the rock,
> Sweet the wave of Yarrow flowin'.

"Flows Yarrow sweet?" she argues with him—

> Flows Yarrow sweet? as sweet, as sweet flows Tweed;
> As green its grass, its gowan as yellow;
> As sweet smells on its braes the birk,
> The apple frae its rock as mellow.

The late Professor Veitch laid finger on the only blot in this fair picture. Apples do not hang from rocks either in Tweedside or by Yarrow, but rowan berries do. It is a pity that Hamilton yielded so far to eighteenth century classicism as to introduce the conventional apple. The line would surely have run more smoothly—

> "Fair hangs the rowan frae the rock."

But I have wandered away from the birch. Economically, this tree has hitherto been reckoned of indifferent value, though there is an inexhaustible demand for bobbins. Clogmakers, also, will make picturesque encampment among birches of suitable size, and pay a fair price for working up the stems.

Of the well-nigh imperishable bark no use is made in this country, except that chemists extract from it an antiseptic called pyrobetulin, used also in the preparation of glass for engraving. But Scandinavian farmers sheath their wooden houses with birch bark, which makes a durable, waterproof covering, with a beautiful silvery appearance very gratifying to eyes offended by the evil aspect of corrugated iron. In Russia, also, a fragrant oil is distilled from birchwood, whence Russia leather derives its peculiar odour. Careful housewives should note that there is no kindling equal to birch bark, which blazes up almost as fiercely as celluloid.

Of late years, a new use has been found for birch, deserving attention from owners of land whereon this tree grows naturally. The small branches and spray are found serviceable in the preparation of steel plates, the price given at present being about 46s. a ton. The trees should be cut before the sap rises, else the bundles will lose weight in drying. In dealing with a birch wood for this purpose, the crop may be considered recurrent at short rotation; for numerous suckers arise from the roots after the tree is felled and grow very rapidly. It is to be

noted with satisfaction that the well-nigh omnivorous rabbit cannot digest the young growths of birch; at least, it does not devour them wholesale.

The birch is very impatient of the shade of other trees. In its turn, although its delicate foliage might not be supposed to stop much light, its shade is very injurious to all other deciduous trees except the beech; a quality which causes one to wonder that such an experienced observer as P. J. Selby should have recommended it as a nurse for oak.[1] It is liable to be disfigured by the morbid growths popularly known as "witch's brooms." Authorities differ as to the cause of these fascinated bundles of twigs, some attributing them to the action of a fungus, *Exoascus betulinus*, others to the irritation brought about by a gall-mite (*Eriophes rudis*) attacking the buds. Probably both are contributory agents.

The Gaelic for birch is *beith* (pronounced "bey"), and may be recognised in numberless Scottish place-names, such as Drumbae, Auchenvey, Largvey, etc. The derivative *beitheach* (pronounced "beyoch"), signifying a birch wood, appears as Beoch in Ayrshire, Galloway, and Dumfriesshire.

Of exotic birches suitable for cultivation in the United Kingdom, there is a very complete collection in Kew Gardens. Among the North American species the black or cherry birch (*Betula lenta*) probably produces the best timber, but the most ornamental is the paper birch (*B. papyrifera*). The Japanese (*B.*

[1] *British Forest Trees*, p. 229.

maximowicsii) seems to promise better bulk than any other as a forest tree in this country.

WILLOW BY THE STREAM

The Willows

"I offered him my company to a willow-tree, either to make him a garland, as being forsaken, or to bind him up a rod, as being worthy to be whipped."—*Much Ado About Nothing*, Act ii. sc. i.

"Willows whiten, aspens quiver,
Little breezes dusk and shiver
Through the wave that runs for ever
By the island in the river
Flowing down to Camelot."

The Lady of Shalott.

A CERTAIN botanist of distinction being consulted by an amateur about some variety of willow exclaimed: "Pray, don't tempt me among the willows; that way lies madness!" They are, indeed, a most complex family, consisting of no fewer than one hundred and sixty recognised species, besides those chance hybrids which, being not only wind-fertilised, but diœcious (that is, the male and female inflorescence is borne on separate trees), they are so prone to produce. Bentham and Hooker admitted fifteen species as indigenous to the United Kingdom, ranging from *Salix herbacea*, dwarfest of British shrubs, humbly crouching on bleak moun-

tain crests and seldom rearing its fairy branchlets to a greater height than a couple of inches, to the massive white willow (*S. alba*), which may tower to the height of nearly 100 feet.

British foresters have not hitherto turned the capabilities of the better kinds of willow to such account as might be done, for, except in the osier industry and for the manufacture of cricket bats, willows are scarcely ever cultivated for profit. When they are planted at all they are generally shoved into some piece of sour, swampy ground, fit for nothing else; and the fact that they will actually flourish in such places is taken as evidence that they prefer them. But the better willows appreciate a kindly soil as much as any other tree, and it is only on wholesome, but moist, land that they develop their proper qualities.

By far the most valuable willow in the present condition of the timber market is the blue willow, which some botanists distinguish as a species under the name of *Salix cœrulea*, but which is more generally deemed to be a hybrid between the white willow (*S. alba*) and the crack willow (*S. fragilis*). It is easily distinguished from both its reputed ancestors; first, by its habit, which is far more erect than that of the others, all the branches ascending without any tendency to spread or droop; second, by its leaves, which are not nearly so downy as those of the white willow, and of thinner texture, so that, when one is held up against the light the tertiary venation may be seen through a lens to be translucent; and, third,

by the bark, which is quite different from the rugged covering of the crack willow, and much smoother than that of the white willow. The fissures or seams in the bark are straight and set close together, enabling one to distinguish the blue willow from all other kinds at all seasons. The general tone of the foliage is silvery blue, instead of the silvery grey of the white willow.

The peculiar value of this willow consists in its producing the only wood suitable for first-class cricket bats. Golf has threatened, but has not yet undermined, the supremacy of cricket; and so long as the English national game holds its own, so long will good samples of the blue willow command a high price. It was in the eastern counties of England that this tree originated, and it is thence that dealers continue exclusively to draw their supplies, being willing to pay what might be thought extravagant prices for the right article. Thus, Elwes records how, in January, 1912, eleven willows were sold in Hertfordshire at fourteen years of age for £81, or about 13s. per cubic foot. These trees had made amazingly rapid growth, ranging from 50 to 60 feet high; but the quality of the wood does not seem to deteriorate with age and bulk, for in 1888 a blue willow, fifty-three years old, was sold at Boreham, in Essex, and manufactured into 1179 cricket bats. This tree measured 101 feet high, with a girth of 16 feet 3 inches. From the same estate another blue willow was sold in 1911 for £70. The dimensions have not been recorded, but the purchaser estimated the price

of the serviceable wood at about £1 per cubic foot. Even more remarkable seems the experience communicated by Mr. J. Barker of Pishiobury, Sawbridgeworth, to the *Gardeners' Chronicle* in 1906. He states that a parcel of land was bought for £50 in 1889 and planted with willows, which were sold in 1905 for £2,000.

Such results as these have no parallel in British forestry; and it may be deemed strange that more attention has not been given to the cultivation of the blue willow. Even in Herts and Essex few of those who grow it for the market are at pains to clear the stems of branches to a greater height than 12 or 15 feet. There appears to be nothing exclusively in the dry climate of East Anglia essential to the development of good "bat" qualities; for Mr. J. A. Campbell of Ardluaine (to whom I owe thanks for some sets of this willow) has received a most favourable report on the wood of trees grown by him in the humid atmosphere of Lochgilphead. In short, the blue willow is as tolerant of conditions of soil and climate as any other native willow, and could probably be grown at a profit in any county of the United Kingdom where shelter from violent winds can be had; but, of course, extended sources of supply would naturally cause a fall in the present exorbitant prices.

The approved method of propagating the blue willow is by large "sets" from 10 to 20 feet long, cut from the branches of trees that have been felled. These have to be sharpened at the butt and firmly

set in holes 3 feet deep, formed by driving in and removing a stake. Like the poplar, the willow imperatively demands light, and to obtain a fine quality of timber, the growth must be rapid. Being so impatient of shade, these trees must not be subjected to planting in close canopy, as recommended for coniferous and other trees. The "sets," therefore, should be planted fully 30 feet apart; and to secure a clean bole, side buds must be rubbed off the saplings, and careful pruning applied in later years.

It must not be supposed that the supply of cricket bats exhausts the purposes to which the wood of the blue willow may be applied. This variety should be planted in preference to any other, because it exceeds all others in rapidity of growth, and produces timber of fine quality faster than any other tree that can be grown in the British Isles. But the white willow (*S. alba*), more commonly known as the Huntingdon willow, also yields a rapid return of light, tough wood, very durable, and suitable for flooring, couples, cart and waggon bodies. Dr. Henry measured two Huntingdon willows near Palnure, Kirkcudbright, in 1904, and found them respectively 86 feet high by 10 feet 8 inches in girth, and 82 feet by 12 feet 9 inches. But the largest willow of this species now growing in Scotland is probably one at Coodham, near Kilmarnock, which girthed 17 feet 1 inch in 1904.

Leaving aside the kinds of willow cultivated for osiers (a most profitable industry), the only other native species worthy of consideration as a timber tree is the crack willow (*S. fragilis*); so called because

of the fragility of the branchlets in spring. A remarkably vigorous variety of the species, popularly known as the Bedford willow, and scientifically as *S. Russelliana*, appears to have originated about the year 1800, probably as a hybrid. A large specimen growing in Messrs. Samson's nursery at Kilmarnock was blown down in 1911. It was 80 feet high and 16 feet in girth.

Both the crack willow and the Bedford willow may be easily distinguished from the white or Huntingdon willow by their rugged bark, seamed with broad and deep grooves, and by their foliage, which is green and shining, each leaf ending in a long point bent to one side. The timber is inferior in quality to that of the white and blue willows; nevertheless, it is recorded in Lowe's *Agricultural Survey of Notts* (p. 118) that a plantation of Bedford willows "yielded at eight years' growth poles which realised a net profit of £214 per acre." It is not unlikely, considering the confusion which prevails among species and varieties, that these were blue, not Bedford, willows.

The lugubrious associations with which poets have invested the willow probably may be traced to the English translation of Psalm cxxxvii. 2; but, as noted on page 81, no willow grows on the banks of the Euphrates, and it was a species of poplar whereon the captive Jews hung their harps. Linnæus may be excused, in consideration of the difficulties of travel in the eighteenth century, for having named the weeping willow *Salix Babylonica*, though that species is only to be found wild in China; but it is

an instance of the mischievous practice of one writer copying the statements of another that in Kirkby's *Trees* we read that the weeping willow "grows abundantly on the banks of the Euphrates and other parts of Asia, as in Palestine, and also in North Africa."

The name "willow" speaks to us of a time when our Anglo-Saxon forbears dwelt in wattled houses. They spoke of the tree as *welig* and also as *widig* (whence our "withy"), the root-meaning being pliancy. Another old English name for the tree was "sallow," which in the north has been shortened into "saugh," a term associated with one of the darkest episodes in the somewhat murky annals of the Stuart dynasty; for it was at Sauchieburn near Stirling that James, Duke of Rothesay, aged fifteen years, was brought by the rebel lords to do battle with his father James III. on 11th June, 1488. King James, flying from the field, was done to death; and, in contrition, his son wore an iron chain round his waist till he, too, fell as James IV. at Flodden, twenty-five years later.

The Gaelic for willow is *saileach*, whence innumerable place-names in Scotland and Ireland, such as Barnsallie, Barsalloch, Sallachy, Lisnasillagh, etc.

The Hornbeam

THE hornbeam (*Carpinus betulus*) belongs to the birch family and the beech belongs to the oak family, so they are far from being nearly akin; nevertheless, the hornbeam and the beech have certain qualities singularly similar in the two species.

First, the hornbeam imitates the foliage of the beech so closely that when either of them is dressed as a hedge plant (a purpose for which both are peculiarly suitable) it requires close inspection to determine which tree it is. Second, except the elder, the beech and the hornbeam are the only shade-bearers among our indigenous deciduous hard-woods—that is, the only broad-leaved trees—that will flourish under the shade and drip of other forest growths, thereby proving most useful for under-planting. Third, as firewood there is none equal to either beech or hornbeam, both of them excelling all other woods in the amount of heat they discharge in combustion.

With these three particulars the resemblance between these two trees ceases, for whereas the beech, under favourable conditions, soars aloft to a stature

FRUIT OF HORNBEAM (*Carpinus betulus*)

of 130 or 140 feet, the hornbeam seldom exceeds half that height. Moreover, while the beech is distinguished among all our forest growths by its smoothly cylindrical trunk, the stem of the hornbeam is always fluted and ridged, often very deeply.

Of the eighteen species of *Carpinus* known to botanists, only one, the common hornbeam, is indigenous in the British Isles, and there only in the southern parts of England, Oxford and Norfolk being about its northern limit, corresponding roughly with that of the nightingale. But whereas the nightingale cannot be seduced into sojourn beyond its hereditary bounds, the hornbeam flourishes freely when planted in any part of the United Kingdom suitable for tree growth. On the Continent it has a very wide range, extending through Central and Northern Europe into Asia Minor, but it has not been found wild in Spain, Portugal, or Sicily.

As a timber producer its chief value in this country has almost gone since the substitution of coal for wood as fuel became general. In former times the trees were grown as pollards, and regularly cut for firewood, evidence of that industry being still to be seen in the condition of the hornbeams in Epping Forest and other places in Kent, Herts, and Essex. The timber, says Elwes, "is the hardest, heaviest, and toughest of our native woods"; but it is useless for outdoor work, being as perishable as beech when exposed to weather. It still competes with foreign woods in the pianomaker's trade, its firm texture, resembling that of ivory or horn, rendering it excellent

for fine action work. But as the slow growth of the tree and the imports of foreign woods are prohibitive of any prospect of profit to the British planter, the only service to which the hornbeam can be usefully put in this country is the production of firewood and the formation of hedges.

Nor can the hornbeam claim high rank as an ornamental tree, though fine specimens may be seen in many English and a few Scottish parks. Elwes mentions Cobham Park, Kent, as containing hundreds of hornbeams from 70 to 80 feet high, and quotes Sir Hugh Beevor as authority for one 100 feet high and 9 feet 8 inches in girth at High Wycombe, Bucks. I have never seen a hornbeam of that size; the largest with which I have made personal acquaintance being one at Gordon Castle, which Loudon described as being 54 feet high in 1837. Sixty-seven years later it had added only 14 feet to its stature, Elwes having found it to be 68 feet high in 1904, with a girth of 8 feet.

The Alder

OF the three species of alder indigenous to Europe, namely *Alnus incana*, *A. cordata* and *A. glutinosa*, only the last named succeeded in establishing itself in the British Isles after the retreat of the ice-field; though the other two grow readily enough when planted in this country.

"Alnus, the alder," wrote John Evelyn, "is of all other the most faithful lover of waterie and boggie places, and those most despis'd weeping parts or water-galls of forests." It has never been a popular tree, either with foresters, poets, or landscape gardeners, yet it has the merit of clothing ground which will not satisfy the wants of any other lofty growth, thriving in swamps too sour even for the willow. "Where do you put your brown tree?" is said to have been asked by one artist of the Georgian era of another; and the rounded outline and sombre foliage of a mature alder must have served many of the old school of landscape painters in their conventional compositions.

The alder neither contributes tender verdure to the gaiety of spring nor brilliant tints to the splendour

of autumn; dull rifle green is the livery donned in April, remaining unchanged till the frosts of late October. Nor does this melancholy tree gladden the waterside with any brightness of blossom; the male and female catkins, appearing before the leaves, are dull, brownish yellow; beautiful objects under a lens, but contributing little to cheer the wayfarer, save as being sure harbingers of summer days. These flowers are followed by cones, which are green at first, but, turning black when ripe, only serve to deepen the gloom. Nevertheless, an alder copse in February and early March has a quiet beauty all its own. The smooth twigs are glazed with a waxy secretion and the swelling buds are plum-coloured, which the level sun-rays light up into a charming purplish bloom. Many a time when in pursuit of spring salmon I have enjoyed the sight of a bevy of old blackcocks busy among the branches of the alders, whereof the buds and catkins provide them with provender during the hungriest months of the year.

There are about five-and-twenty known species of alder, all bearing a considerable family likeness, and none exceeding in stature our only native species, *Alnus glutinosa*. Of this, many specimens might be mentioned between 70 and 90 feet high, though it is often difficult or impossible to obtain right measurement owing to the trees growing beside rivers or lakes. The most remarkable alder wood known to me is at Kilmacurragh, in County Wicklow. In the old spacious days the ground it occupies was a deer park. The trees are ancient, but not very lofty, from 50 to

60 feet high; but many of them have clean boles up to 30 or 40 feet and girth from 8 to 10 feet. One of them had a girth of 11 feet 4 inches in 1906. In the swampier parts of the wood, some of the trees have got bowed; their trunks present a curious appearance from being densely covered with pennyroyal (*Cotyledon umbilicus*). There can be little doubt that this grove is a fragment of the primæval Irish forest.

There are some very fine alders beside the Gade in Cassiobury Park, Herts, one of which Dr. Henry made out to be 85 feet high, with a girth of 11 feet 6 inches; but these dimensions were exceeded by an alder 90 feet high with a girth of 11 feet 4 inches at Betchworth Park, Surrey, and by one at Enville Park, Stourbridge, 87 feet high, with a girth of 8 feet 2 inches.

In Scotland the tallest measured by him was at Scone—66 feet high by 6 feet 3 inches in girth; but no doubt there are bigger alders than that north of the Tweed, though it might not be possible to match a shapely tree measured in 1904 at Churchill, Co. Armagh, which stood 94 feet high, girthing 6 feet 4 inches, and having a clean bole of 60 feet.

The aforesaid tree at Scone is of the cut-leaved variety, a sport which, originating in France, and being planted in De la Berlière's garden near Saint-Germain, says Loudon, became the parent of all that are now to be found. It is certainly more ornamental than the common form, the leaves being divided half-way to the midrib into three to six segments on each side.

The Alder

The alder is not rated high among us as a timber tree, though good boles are sometimes in request, for what precise purpose I cannot tell. Mr. Elwes states that he sold three hundred alders standing for £100, which he reckoned to be at the rate of 4d. or 5d. a cubic foot. This must be considered an excellent return from land that was fit for no other crop. Clog-makers take alder of suitable size as readily as birch, giving as much as £40 an acre for coppice, which will be fit for cutting again in twenty years. One of the most picturesque scenes in forestry is a summer encampment of clog-cutters.

In Scotland probably the demand for alder for making herring barrels would be steady and inexhaustible, were there any regularity in the supply; but in this, as in other British forest products, so much uncertainty is caused by the haphazard and capricious felling practised by landowners in general, that the trade derives its supplies of staves from abroad. For outdoor purposes, the timber is far too perishable under vicissitudes of wet and dry; but for piles under water it is most durable. Evelyn states, without quoting his authority, that the Rialto at Venice is founded upon alder piles. For three hundred years charcoal made from alder was more highly esteemed than that from any other wood for making gunpowder; but modern explosives have caused it to be in less request nowadays.

There may be some trout-fishers who have not learnt that an effective way of taking the objectionable glitter from a gut cast is to draw it two or three

times through an alder leaf. Evelyn says that such leaves afford great relief to footsore travellers if laid within the stocking.

In his *Sylva Florifera* (1823), Henry Phillips admits us to a glimpse into the domestic economy of our great-grandmothers, who had to contend with certain difficulties from which modern households are happily exempt. "The good housewife," he says, "is not unacquainted with a property in the leaves [of alder], with which she strews her chambers before sweeping, for, when fresh, they are covered with a glutinous liquor that entangles fleas like birds in birdlime."

The English name "alder" has been disguised by the addition of the *d*. It was *alr* in Anglo-Saxon, *r* taking the place of the Latin *n* in *alnus*, which is preserved in the French *aune*. In one form or another it exists in all Teutonic dialects; we, in Scotland, retain very closely the Anglo-Saxon sound when we speak of "eller," though we have allowed the intrusive *d* to slip into Elderslie, the paternal home of William Wallace. This tree has given rise to countless place-names; in England—Alresford on the Itchen, Allerton (eight or nine times), Allerdale, Ellerbeck, Ellerburn, Ellerton, and so on; in Scotland—Allershaw in Lanarkshire, Allerton in Cromarty, Allers near Glasgow, Allerbeck in Dumfriesshire, Ellerrigs, Argyllshire; Ellerslie, in several counties, etc. I incline to think that the frequent and puzzling name Elrig or Eldrig may be associated with alders.

In Gaelic the alder is called *fearn*, which appears

in a multitude of place-names, such as Balfern, Glenfarne, Farnoch, Fearn, Fernie, and Fernaig. The consonant *f* being liable in Gaelic to be silenced by aspiration, the descriptive name *amhuinn-fhearn*, alder river, has been worn down into Nairn, and probably some, at least, of the numerous streams called Earn or Erne derive their titles from a similar contraction.

Among the exotic species of alder I only know of one worth attention for ornamental purposes, to wit, the heart-leaved alder (*A. cordata*); which, being found indigenous only in Corsica and Southern Italy, might scarcely be expected to take kindly to our humid climate. It does so, however, growing as vigorously as our native alder, and proving somewhat more decorative. The leaves are of a shining, dark green with lighter undersides, and the cones are at least an inch long, carried erect.

The grey alder (*A. incana*) has nothing to recommend it; except, perhaps, to Norwegian anglers, who know how the fieldfares nest among its thickets in garrulous colonies. It is not easy to understand how the British Isles have missed having this species as a native, for it is very widely distributed over Europe from the shores of the Arctic Ocean on the north to Servia and the Apennines on the south. It is also spread widely over the northern United States and Canada.

TULIP TREE
At Wadham College, Oxford

TULIP TREE (*Liriodendron tulipifera*)
AT ALBURY PARK, SURREY
Height 96 ft., girth 11 ft. 8 in.

The Tulip Tree

THE tulip tree (*Liriodendron tulipifera*) is descended from an extremely remote ancestry, and remains one of the stateliest denizens of the North American river valleys, ranging from 150 to 190 feet high. The form of its leaves is unique among those of forest trees, being lyrate, ending in two pointed or rounded lobes considerably longer than the midrib. Ruskin declared it to be the only leaf which did not display one form or other of a Gothic arch—round or pointed. These leaves turn a beautiful clear yellow in autumn, and in summer the flowers, in size and shape like those of a tulip, attract numbers of bees. If only they were a little more gaily painted, the tulip tree would be among the showiest of park trees; but the petals are of a dull greenish white, with a splash of orange at the base of the interior of each, where one can't see it—unless one happens to be a bee.

However, its flowers apart, a well-grown tulip tree is a beautiful object at all seasons, owing, in winter, to the tracery of its smooth, grey branches—in summer, to its rich, bright green foliage, and in autumn to the splendour of its decay.

The Tulip Tree

It was probably brought to England in the reign of Henry VIII. or Elizabeth by one of those botanists —Tradescant or another—who quietly pursued their useful labours while Christians were hurrying each other to the stake, and politicians were chopping off the heads of inconvenient opponents.

> In lofty towers let Pallas take her rest,
> Whilst shady groves of all things please us best.

In the following century Evelyn said "the tulip tree grows very well with the curious amongst us to a considerable stature. I wish we had more of them." Given deep, generous soil and suitable shelter, this fine tree might develop in England proportions equal to those it attains in its native forests, where, says Elwes, it reaches "a height of 160 to 190 feet, with a straight trunk 8 to 10 feet in diameter, clear of branches for 80 to 100 feet from the ground." But its requirements in soil and shelter are imperative; it is a greedy feeder, and its branches are too friable to stand violent winds. Meet conditions have been secured at Woolbeding, already mentioned as the site of the loftiest plane in Britain. The tulip tree there has reached a height of 105 feet, with a girth of 17 feet. Another, of equal height, but less girth, is reported from Strathfieldsaye, which I must have missed when I was there, for I have no note about it.

In Scotland, the largest tulip tree I have seen is one at the Hirsel, in Berwickshire. Loudon mentioned it in 1837 as being 100 years old and 20 feet in girth, but when I saw it last, some fifteen years

ago, it was failing in the upper storey, though it still had some vigorous foliage. It is said to bear flowers every year; though Lord Barrymore tells me that in his famous arboretum on Fota Island, Cork Harbour, the tulip tree grows well, 87 feet high and 11 feet 7 inches in girth, but never flowers. Probably, like the Oriental plane, it demands hotter summers than we can give it in the north and west. In the southern counties of England it blossoms abundantly, and occasionally ripens seed.

Tulip tree timber is not of the first quality. Professor Sargent describes it as light, soft, and brittle. Nevertheless, it is much used in America for interior work and boatbuilding, and is imported by English merchants under the name of yellow poplar or canarywood. Mr. Elwes, who had a fine collection of different kinds of timber made into furniture and panels, says it closely resembles magnolia wood, which is not to be wondered at, seeing that the tulip tree belongs to the order Magnoliaceæ.

Few people plant tulip trees nowadays, more's the pity; for they are far more decorative than many of the conifers which have gone so far to thrust deciduous trees out of fashion. It grieved me some years ago to see a Spanish silver fir (*Abies pinsapo*), one of the least majestic of its family, planted as the memorial of a royal visit to a fine English demesne; it grieves me still when I reflect how little chance it has of thriving on a shaven lawn.

The Hawthorn

"Gives not the hawthorn-bush a sweeter shade
To shepherds looking on their silly sheep,
Than doth a rich-embroidered canopy
To kings that fear their subjects' treachery?
O, yes, it doth—a thousandfold it doth."
(*Third Henry VI.* act ii. sc. 5.)

THE rose has long disputed with the lily her claim to rank as Queen of Beauty, nor is the rivalry likely to be decided in favour of either so long as human tastes differ. Howbeit, if the two claimants ever appeal to the arbitrament of war, the rose will have the advantage of big battalions, for her great clan far outnumbers that of the lilies and many of them are formidably armed. There would, indeed, be some mighty blanks in our fields and gardens if the great natural order of Rosaceæ were banned; for not only should we lose the enormous and ever-increasing variety of the rose itself and its hybrids, but the spiræas, the cinquefoils, the coton-easters, the so-called laurels (which are not laurels at all, but evergreen plums), wherewith we deck our pleasure-grounds, would disappear also, and with

MAY BLOSSOM (*Cratægus oxyacantha*)

FRUIT OF HAWTHORN (*Cratægus oxyacantha*)

them the plums, cherries, peaches, apples, pears, strawberries, and raspberries would be among the exiles, for all these and many more are families in this vast order.

Yet would not the disappearance of any of them work such a change in British landscape, as it would suffer if we were to lose the hawthorn, which is also a member of the rose order. It is the most beautiful native flowering tree we possess, for the laburnum, the horse chestnut, and the catalpa must be written off as exotics, though, happily, they have proved most successful colonists.

Not long ago I was driving out from New York to visit Mr. Roosevelt in Long Island. My companion and cicerone was one who gained more than the common measure of esteem while he was American Ambassador in London. When I expressed to him warmly my admiration for the masses of *Cornus florida* which formed the undergrowth of the woods bordering our route, and which (it was in May) were displaying their snowy blossoms in endless drifts and wreaths: "Very beautiful," he said; "but I would rather have your British hawthorn blossom with its fragrance."

This was high testimony from one in whose country Professor Sargent has enumerated no fewer than one hundred and forty-three distinct American species of *Cratægus* or hawthorn, many of which produce beautiful flowers; but none of those which I have seen are equal to the single species indigenous to the British Isles—*Cratægus oxyacantha*. In saying

a single species, I am aware that later botanists have distinguished as a species a form found on the Continent and in the midland and south-eastern English counties; but Bentham and Hooker admitted this only as a variety.

In Scotland we always speak of hawthorn blossom, but in England you shall never hear that term, for there they call it May blossom, yet you may seldom find it in bloom till near the end of that month. In Brand's *Antiquities* (1777) it is stated that "it was an old custom in Suffolk in most of the farmhouses that any servant who could bring in a branch of hawthorn in full blossom on the 1st of May was entitled to a dish of cream for breakfast. This custom is now disused, not so much from the reluctance of the masters to give the reward, as from the inability of the servants to find the white thorn in flower." The reason for this is to be sought in a change, not in the flowering season, but in the calendar; the old style during the eighteenth century being twelve days in arrear of the new style, so that May Day was equivalent to what is now 12th May. It will be remembered that, while the new style was enacted in Scotland by James VI.'s Privy Council in 1600, it was not until 1751 that an Act of Parliament caused it to be adopted in England, which did the Suffolk peasants out of all chance of cream for breakfast.

One of the many admirable virtues of the hawthorn is its indifference to soil and situation. Give it light and free air, and it will flower as freely on the

shingle of a wind-swept beach, where it crouches along the stones to escape the blast, as it does in a fat English pasture, a villa garden, or a Highland glen. The most remarkable grove of ancient hawthorns known to me is to be seen in the Phœnix Park, Dublin. It is a sight never to be forgotten when these trees, many of them (speaking from recollection) 40 feet high, are laden in June with their snowy wreaths. There are many hawthorns of greater height in other districts, notably one at Lenchford, in Worcestershire, whereof the dimensions in 1875 were recorded in the *Gardeners' Chronicle* as 60 feet high and 9 feet in girth.

The hawthorn is a long-lived tree. It was not until after the middle of the nineteenth century that Maxwell's Thorn disappeared from the banks of the Dryfe in a flood. It was under this tree that, according to local tradition, John Lord Maxwell, the Warden, lay wounded after the fatal encounter with the Johnstones on Dryfe Sands, 6th December, 1593. Eight hundred of his men are said to have perished, and the old lord, "a tall man," says Spottiswoode (vol. ii. 446), "and heavy in armour, was in the chase overtaken and stricken from his horse." William Johnston of Kirkhill was his assailant; who, according to some accounts, contented himself with hewing off the Warden's hand, in order to claim the reward offered by his chief to any man who should bring it to him. As Maxwell lay bleeding under the thorn tree, a lady came on the scene—some say it was the lady of Lochwood herself, the Chief's wife,

others that it was the wife of James Johnston of Kirkton. Whichever it was, she belonged to the militant party of her sex, if it be true, as alleged, that she knocked out the Warden's brains with the tower keys that hung at her girdle. In justice to the dame it should be mentioned that a few nights previously Lord Maxwell had burnt down Lochwood Tower, declaring that "he would give the Lady Johnston light to set her hood!" Moreover, he had offered the gift of a farm to anyone who should bring him the head of the laird of Lochwood, who, being in arms against the Warden, was technically the King's rebel. Maxwell's Thorn, as aforesaid, ceased to exist sixty years ago, but a young tree was planted in its place, which doubtless will be venerated by generations unborn as the original.

The kindly nature of the hawthorn and the simple nature of its cultural requirements have caused everybody to be familiar with the beautiful red and pink, single and double, varieties which have been raised and widely distributed. There is a variety with scarlet berries which I have only seen in the park at Newton Don, near Kelso. Beautiful as are the common red haws upon which fieldfares, redwings, and other winter visitors mainly depend for provender, this scarlet fruited variety is a much more brilliant object at the dullest time of the year. The variety with yellow haws is no improvement on the type.

Phillips in his *Sylva Florifera* (1823) states that "a variety has been discovered in a hedge near

Bampton, Oxfordshire, which produces white berries." This variety, if it ever existed, appears to have been lost. He also commits himself to the statement that "the fruit of this tree are called haws, from whence the name hawthorn"; which proves that a man may be an excellent botanist and a bad etymologist. In Middle English "hawe" meant a hedge, and also ground enclosed by a hedge. It was in the latter sense that Chaucer wrote in the *Canterbury Tales*:

> And eke there was a polkat [polecat] in his hawe.

The tree got the name of hawthorn, *i.e.* hedgethorn, because it has no rival as a hedge plant.

And this brings us to consider what is the economic value of the hawthorn. It has become indispensable for hedges, which are as inseparable from a foreigner's impressions of English landscape as poplars are from French country scenery, and as date palms are from that of Egypt.

> Green fields of England! wheresoe'er
> Across the watery waste we fare,
> Your image in our hearts we bear,
> Green fields of England, everywhere.

But the fields would not be so green, they would not indeed stamp themselves on the memory as fields at all, were it not for the hedges that mark them off. In Scotland hedges are not so universal, the preference being given to stone dykes, where the necessary material lies to hand, or, alas, to barbed wire, which,

effective though it be as a fence, prevails to vulgarise the fairest scenery. Dr. Walker states in his *Essays of Natural History* (1812) that Cromwell's soldiers first planted, or taught the Scots to plant hedges in East Lothian and Perthshire. They learnt the planting all right, but not, it would appear, the subsequent management ; for, except in the Lothians, it is the exception to see hedges rightly tended. The plants are allowed to straggle and to be browsed bare below by cattle, when the gaps are repaired by running a wire through them. Far more admirable is the craft of the English hedger, who knows how to make a beautiful and durable fence by plashing and binding.

The timber of hawthorn possesses more merit than is usually assigned to it ; in fact, there cannot be said that there is any market for it, owing, probably, to the rough state in which it is almost invariably grown. But it is hard and heavy, with a fine grain, taking a good polish. Some of the woodcuts in back numbers of the *Gardener's Chronicle* were engraved on hawthorn ; but Mr. Elwes, who has experimented practically with every British wood, considers that boxwood is of superior texture.

In the good times of old, when men strove more earnestly to cut each other's throats than, as at the present day, to catch each other's votes, every Highland clan has a distinctive badge consisting of a sprig of some common plant whereby friend might be known from foe. The small sept of Ogilvie chose the hawthorn.

The Hawthorn

No tree or plant has lent its name more freely to denominate places. The Norsemen are responsible for *Thorn-ey* on the left bank of the tidal Thames, to which the Saxons, forgetting that *ey* is good Norse for "island," extended the name pleonastically to Thorney Island, and then came Edward the Confessor to obliterate both names by building on the island the abbey and church—the West Minster.

Countless are the places called Thornton, Thornhill, Thornbury, etc., in England, all named from the hawthorn—the thorn of thorns; while in Scotland, besides romantic Hawthornden, and in Ireland, the Gaelic word *sceach* or *scitheog* (*th* silent) occurs in almost every parish in some form or other—Skeog, Skeagh, Skate, Drumskeog, Tullynaskeagh, etc.

A foreign relative of the hawthorn may be mentioned here as being more worthy of consideration as a timber tree, and, besides, being exceedingly ornamental, namely, *Cotoneaster frigida*. Most people are familiar with the genus *Cotoneaster* in the form of shrubs of modest stature, producing quantities of red berries; and in gardener's dictionaries, etc., one reads that this Himalayan species grows about 10 feet high. If it did no more than that, it would be well worth planting for the sake of its woolly cymes of white flowers in July and the extraordinary profusion of scarlet berries which follows them; yet, even so, it could not claim notice among forest trees. In fact, it promises to outstrip the hawthorn in height. Some of mine have reached a height of 40 feet already, at an age of fifty years, and if care is bestowed on

timely pruning in youth, the wood is straight, clean and very hard. It has not yet been put to any economic use, so far as known to me, but I have a notion it will prove fine material for the heads of golf clubs.

The Rowan and its Relatives

THERE is no group of trees whereof the scientific nomenclature has become so hopelessly confused as the *Pomaceæ*, a sub-order of the vast rose order. The group itself divides itself naturally into seven sub-groups or sections, which some botanists treat as independent species; but British foresters need to concern themselves with only five of these sections—namely (1) *Sorbus*, the rowan; (2) *Aria*, the white-beam; (3) *Hahnia*, the wild service tree; (4) *Pyrophorum*, the pears; and (5) *Malus*, the apples.

Some people may feel impatient with these niceties of classification, and declare that popular names serve all useful purpose; but many of these trees are very beautiful, well deserving the attention of planters, who are sure to be disappointed in being served with the wrong species unless they are at the pains to know exactly what they order from nurserymen, and are able to identify the plants when they get them.

The rowan tree (*Pyrus aucuparia*) is of humble stature, seldom exceeding 40 feet; nevertheless, we should be losers if it disappeared from our woodlands,

not only because of its beauty and the delicious diet which it affords to birds, but because of the peculiar veneration with which, in primitive times, it became invested in Northern Europe. The Norsemen held it to be a holy tree, consecrated to Thor, and their faith in its protective virtues became deeply implanted in the folk-lore of our own country.

> Rowan-tree and red thread
> Gar the witches come ill-speed.

It has been suggested that the singular expression, "Aroint, thee, witch!" occurring nowhere in English literature except in *Macbeth*, Act 1, sc. 3, is a corruption of "A rountree, witch!" but the late Professor Skeat sternly refused to entertain that explanation. Anyhow, so long as belief in witchcraft endured in this country, a branch of rowan was esteemed a sure protection against evil spells. In many a Scottish byre a bunch of rowan may still be seen suspended, and a common feature in cottage garden plots consists of a couple of rowan saplings planted before the door, with their tops plaited together to form an arch, so that comers and goers shall thereby derive protection against witchcraft by passing under the tutelary boughs.

In Strathspey it used to be the custom to cause all sheep and lambs to pass through a hoop of rowan wood on the 1st of May, and flocks and herds were driven to the summer shieling with a rod of the same wood. In some parts of England the rowan is still called the "witchen." Evelyn wrote of it under

FLOWERS OF THE ROWAN (*Pyrus aucuparia*)

that name, and said that in his day (1620-1706) the tree was reputed so sacred in Wales "as that there is not a churchyard without one of them planted in it; so on a certain day in the year everybody religiously wears a cross made of the wood."

By the by, let no lover of woodland ever speak of a mountain ash when he means a rowan. That is a silly name, for the rowan has no affinity with the ash, and although it may be found growing in the Highlands at a height of more than 2,000 feet, yet it is just as much at home anywhere between that altitude and the seaboard. We need not be ashamed of having borrowed the name "rowan" from the Norsemen, for there is a strong Scandinavian strain in our island blood. The Swedes spell it *ronn*, the Norwegians *rogn*, and the Icelanders *reynir*.

The chief claim which the rowan has upon our affection is its autumnal beauty. If the birds would only suffer its scarlet berries to hang a little longer than is their wont, no British tree could match it in brilliancy of fall. It is widely distributed over northern and central Europe, and is established in Iceland, whither it was perhaps carried long ago by pious Norsemen, for it does not occur in America. Little use is now made of its timber, which is very hard, heavy, and tough; so much so that in old days it was reckoned as only second to the yew for bow-making. It is mentioned in the Act 8 Elizabeth c. x. as "witch-hazel," among the woods whereof every bowyer dwelling in London was to keep fifty bows ready in stock.

The Rowan and its Relatives

Among the place-names into which the Gaelic name for the rowan—*caorunn*—enters may be mentioned Attachoirinn in Islay, Barwhirran in Wigtownshire, and Leachd a' chaorruin in Corrour Forest.

The rowan cannot be confounded with any other species of this family, nor with any of the numerous hybrids which have arisen therein, for it is easily distinguished by its pinnate leaves, consisting of eleven to fifteen leaflets set herring-bone fashion on a midrib about 6 inches long. Except the true service (*Pyrus sorbus*) all the other species carry entire leaves, lobed in some species, but never pinnate. The true service tree, though believed not to be indigenous to Great Britain, grows readily there, though it is not planted so often as it deserves to be, both on account of its beautiful and useful timber and of the excellent fruit which it bears profusely, qualities which cause it to be very extensively cultivated in France. It is also a highly ornamental tree, as those may testify who have visited Vevay in autumn and admired the brightness of fruit and foliage in the avenues of service trees planted there. I do not know of any specimens in Scotland, but there are several fine service trees from 45 to 65 feet high in English parks; none, however, remaining equal in stature to one at Melbury Court, Dorsetshire, which has now departed, but was recorded by Loudon as being 82 feet high in 1830, with a girth of 9 feet 9 inches. The fruit varies much in quality; the better flavoured kinds being highly esteemed by the French peasantry. Evelyn says, "It is not unpleasant; of which, with

new wine and honey, they make a *conditum* of admirable effect to corroborate the stomach." Those who wish to plant this tree had best go to a French nurseryman and order it under the name of *Cormier* or *Sorbus domestica*.

The wild service (*P. torminalis*) will attain a height of 70 or 80 feet if it is given a fair chance, which it seldom gets from us. Its chief recommendation is its handsome foliage, the leaves being deeply lobed. They turn a fine orange colour in autumn, but the fruit adds nothing to the display, being brown when ripe. For ornamental purposes the whitebeam (*P. aria*) is far preferable to the wild service, owing to the snowy whiteness of the young shoots and undersides of the leaves. The fruit, moreover, is bright red; but this is of the less moment, inasmuch as birds devour it so soon as it is ripe. By far the noblest of all the *Sorbus* group is the Himalayan *Pyrus vestita* (also known as *Sorbus nepalensis*). Its broadly oval, pointed leaves are very large, thickly clothed with white wool when young, remaining white on the undersides until late autumn, when they turn to a clear yellow. The clusters of white flowers are very woolly, and are followed by large round red fruits. It is an exceedingly handsome and stately tree, and ought to be better known in this country than it is at present; but much disappointment has been incurred through the vicious practice followed by nurserymen of grafting it high upon the rowan, a tree of much inferior bulk. The result is that the scion, flourishing vigorously for a few seasons,

outgrows the stock, which cannot carry up enough sap to supply the wants of the more robust species. It is pathetic to see the leaves endeavouring to unfold, but failing to do so. There is then nothing for it but to root the whole affair up, and procure seedlings, or, at least, plants grafted *low* on the British stock, which, if deeply planted, enable the scions to throw out roots of their own.

Leaving *Sorbus*—the rowans—let us glance at *Malus*—the apples; and among the fourteen species, all more or less distinguished by the loveliness of their blossom, confine our attention to the wild crab, parent of all our cultivated varieties. Of all the floral displays of British springtide, there is none more exquisite than an old crab in full flower, standing in a sea of blue hyacinths. It says little for our intelligence that, while we are ready to spend lavishly in the purchase of foreign trees and shrubs, many of very doubtful merit, none of us seem to think the crab-tree worth anything except as a stock for grafting orchard apples on.

Nevertheless, the crab has valuable qualities besides its beauty. "Fetch me a dozen crab-tree staves," shouts the porter of King Henry's palace, "and strong ones. I'll scratch your heads!" (*K. Henry VIII.*, Act v. sc. 3). Those golfers who have passed their meridian surely remember that crab was reckoned the only material for club-heads in the old days of hard "gutties." But there was no great store of crab-trees in the land; so when golfers began to become like the sand of the sea for multitude the

supply ran out, and club-masters carved the heads out of beech. A tougher substitute has now been found in the American persimmon (*Diospyros*), but methinks our native crab would hold its own with any other wood if it were still to be had.

Probably the largest crab-tree in Scotland (if it still stands) is one at Kelloe, in Berwickshire, which Sir R. Christison measured in 1876, and found to be 50 feet high and 8 feet in girth.

The wild pear (*Pyrus communis*) is much more rare in Britain than the crab-tree, being found only in the southern English counties, and even there it is difficult to decide whether any pear tree is really wild or only a relic of cultivation. The timber of the pear, whether wild or cultivated, is very beautiful, and is one of the choicest for carved work; whereof a fine example may be seen among the panels in Windsor Castle.

The Gean Tree, or Wild Cherry

IN discoursing about the hawthorn, I assigned to it the first place for beauty of blossom among our native trees, but in holding that supremacy it has a dangerous rival in the gean, or wild cherry, which, to quote John Evelyn's eulogy, "will thrive into stately trees, beautified with blossoms of a surprising whiteness, greatly relieving the sedulous bees and attracting birds." In truth, the verdict upon the rivalry of the hawthorn and the gean must be "honours easy," for if the fragrance of the first turns the scale in its favour in spring, the gean scores heavily in autumn through the gorgeous hues of its fading foliage, no other British tree, if it be not the rowan, equalling it in sunset splendour. Nor is the flower of the gean without a fragrance—more delicate and less powerful than that of the hawthorn. Elwes tells how the late Mr. Foljambe, of Osberton, when old and quite blind, used to cause his son to lead him out among the cherry trees when they were in blossom, that he might enjoy their scent.

The Gean Tree

Doubts have been expressed whether the gean tree can be claimed as truly indigenous, many writers (my friend Canon Ellacombe among others) accepting Pliny's statement (lib. xv. cap. 25) that the cherry was unknown in Italy till Lucullus introduced it from Asia Minor after his victory over Mithridates (B.C. 84), and that it was taken by the Romans into Britain. In support of this view may be cited the absence of any name for the cherry in old Gaelic, the modern word, *sirist*, being merely an adaptation of the Latin *cerasus*, just as *an Siosalach*—the Chisholm—is a rendering of the Norman name Cecil. The Scottish name "gean" does not help us, being borrowed from the French *guigne*. Nevertheless, Dr. Henry follows Bentham and Hooker in regarding the wild cherry as undoubtedly indigenous in parts of Great Britain.

Lucullus, indeed—proverbial for his love of good things—may well have brought to Italy some of the cultivated varieties of the cherry; but the wild tree seems to have established itself as far north as Bergen in Norway, in which province there exists a large wood purely of cherry trees; and Wilkomm reported in 1887 having found semi-fossil remains of the gean in Swedish peat mosses; wherefore let us give ourselves the benefit of the doubt and claim this pretty tree as a native of British soil. Anyhow, it is thoroughly at home in these islands, reproducing itself readily both by seed and suckers, wherever it gets a chance; and no tree should be made more welcome in our woodlands, both on account of its beauty and utility.

The Gean Tree

Hitherto British foresters have treated the wild cherry with unmerited neglect. Nobody thinks of planting geans, except here and there for ornament; nor is there any regular market for the timber. Yet that is of high quality and very ornamental for indoor work, having a fine silky grain and a charming pinkish colour. Mr. Elwes, who has used it for panelling, says that when soaked in lime water it assumes a richer tint, resembling unstained mahogany. It has the merit of seasoning readily, and never warping.

The pews in Gibside Church, Northumberland, were made of cherry wood in 1812, and are reported by Mr. A. C. Forbes to be perfectly sound and well-fitting still. Wild cherry trees are seldom felled till they show signs of decay, and as they are not long-lived—a century being about the outside span of their vigorous life—the quality of the timber should not be estimated from trees more than sixty or seventy years old. The growth is rapid, and the tree may be drawn up in shelter to a great height; there is a specimen in Windsor Park, near the Bishopsgate, which was 93 feet high in 1904, with a girth of 9 feet 3 inches.

In the *Trees of Great Britain and Ireland*, Messrs. Elwes and Henry have a plate representing an extraordinary cherry tree growing in Savernake Forest, with a wild spread of branches and a bole, covered with enormous burrs, measuring 12 feet 7 inches in girth at 4 feet from the ground. A Scottish counterpart to the Savernake tree may be seen at Gribton, near Dumfries, which, though only 56 feet high, has

a girth of 12 feet 8 inches, with a branch spread of 70 feet. A massive gean tree at Mauldslie Castle, Lanarkshire, was 52 feet high in 1899, with a girth of 13 feet 2 inches. It is fast decaying, nor is the iron band with which its fork has been braced likely to prolong its existence beyond the natural term.

The wild cherry is the parent of all the cultivated varieties, many of which are derived from a high antiquity. Pliny enumerates eight varieties, including those with black and red fruits, and one which he describes as appearing half-ripe, which seems to indicate what we know as the bigarreau cherry. No doubt these varieties were of Asiatic origin, the Chinese and Persians having long preceded European nations in the craft of horticulture. The Rev. R. Walsh, writing in the *Transactions of the Horticultural Society*, 1826, described "an amber-coloured transparent cherry of a delicious flavour. It grows in the woods in the interior of Asia Minor, particularly on the banks of the Sakari—the ancient Sangarius. The trees attain gigantic size; they are ascended by perpendicular ladders suspended from the lowest branches. I measured the trunk of one; the circumference was 5 feet, and the height where the first branches issued 40 feet; from the summit of the highest branches was from 90 feet to 100 feet, and this immense tree was loaded with fruit."

Compare with this the produce of a single cherry tree during the year 1913 at Faourg, near Avenche, in the Swiss canton of Vaud. It took three men fifteen days to gather the fruit, which weighed in the

aggregate two tons. The fruit is of a small and red variety, used for making kirsch ; and it was reckoned that the crop of this tree would produce 200 litres of the spirit, which, at 5 francs a litre, amounts to £40.

The scientific name for the gean is *Prunus avium*—the birds' plum ; but what we mean when we speak of "bird cherry" is a very different, though nearly kindred, species—*Prunus padus*, a pretty native tree of small stature which is spread all over northern Europe and Asia. It is very beautiful when covered with its white flowers in long racemes—pity they last such a short time—but the little black fruits are of no use to any creature bigger than a pheasant. Anglers in Norwegian rivers are familiar with the white plumes of bird cherry, waving like fine lace-work from the grim cliffs overhanging many a green *dal*.

Lovely as the gean tree is when in full blossom, some of the double-flowering Japanese cherries are even more so, and they have this advantage, that the display is not nearly so fleeting. What may be the wild parent of these cultivated forms I am unable to say ; but Mr. J. H. Veitch, writing from Yokohama, indicates that some, at least, are not cherries at all :

"The cherries in this neighbourhood are magnificent. Tinted photographs give a very complete idea of their beauty ; one looks up and walks under a ceiling of the softest pink. At Mukojima a row of these cherries a mile long by the river bank, in some places faced by a row on the opposite side of the road, is a sight it will be difficult to forget. Cherries are, in fact, to be seen everywhere in and around Tokio, and it would be difficult to imagine anything more beautiful

GEAN (*Prunus avium*)
IN BLOOM

for the few days they are in flower. The species is known scientifically as *Prunus Mume*; it is really an apricot."[1]

By far the finest display of these cherries that I have seen is in the Arnold Arboretum, attached to Harvard University, Boston, U.S. There Professor Sargent and Mr. E. H. Wilson have got together what are probably the finest groups of these lovely trees outside Japan. The profusion of blossom, snowy white or rich pink, must be seen to be believed. Why is not more use made of them in the gardens of great country houses in our own country? They are perfectly hardy, but, as nurserymen usually supply them grafted on crab stocks, incessant vigilance is required during the young stages to prevent the stock reasserting itself and overcoming the scion.

Probably the reason why these exquisite forms of cherry and plum are not more often seen is to be found in the perverse habit which impels most people who have fine private pleasure grounds to spend the sweet o' the year in London. Having been asked by the wife of a great landowner to take counsel with their Scottish gardener about improving the pleasure grounds round their magnificent castle, and perceiving that the climate was peculiarly mild, the site facing the sea, yet sheltered, I suggested that he should plant some of the fine Himalayan rhododendrons, as it was just the place for them. His reply was resentful in tone. "The wur-r-rst of rhododendrons is that they will not flower when the family's at home." So tactless of the rhododendrons!

[1] *A Traveller's Notes*, by J. H. Veitch, p. 105.

The Walnut

THE very name we have given it forbids us to claim the walnut as a native of the British Isles, for in Anglo-Saxon speech it was *wealh knut*, the foreign nut, just as they called the Celts of the West *wealas*, the foreigners, a name which has persisted to our times, as Wales. So, also, mediæval German writers termed France *das Welsche Land*, and, referring to the whole world, they described it as *in allen Welschen und in Deutschen Reichen*, "in all Welsh and German realms." It is not easy to fix the limits within which the walnut may be accounted indigenous, so widely has it been cultivated for its fruit; but it is certainly found as a wild tree over a great part of south-eastern Europe, through Asia Minor, the Caucasus, Persia, the Himalayas to Burmah, China, and possibly Japan.

More has been laid upon Roman shoulders in connection with their occupation of Britain than perhaps they should justly bear, but we may safely credit our conquerors with having introduced the walnut, which they held in very high esteem as providing a favourite article of food, and the nuts were easily

carried and planted. The name they gave it—*Juglans*, i.e. *Jovis glans*, "Jove's nut"—betokens the value at which they rated this tree. Pliny devotes a long chapter to the walnut, expressing doubt whether it was known in Italy during Cato's life (B.C. 234-149). He says that it was brought into Greece from Pontus (Asia Minor), thence to Italy, wherefore the fruit was called Pontic or Greek nuts. He also describes how these nuts were thrown at weddings, certainly a more formidable kind of missile than rice and confetti, as we now do use.

The walnut has adapted itself to the soil and climate of the British Isles in exactly the same measure as the Spanish chestnut—that is, it will thrive in all parts of the United Kingdom and grow to very large dimensions under reasonable conditions of shelter; but it will not produce fruit worth gathering in ordinary seasons north of the English Midlands. Its merit as a timber tree entitles it to far more attention from foresters than it now receives, for, indeed, it is one of the most valuable hardwoods that can be planted. The fruit was too precious to the Romans to allow the tree to be used for that purpose, but, wrote Juvenal, *Annosam si forte nucem dejecerat Eurus*—"if the east wind happened to uproot an aged walnut"—the timber was highly prized for furniture.

Howbeit, there are walnuts and walnuts. The tree, having been cultivated for its fruit from immemorial time, has developed a great number of varieties, producing large or thin-shelled nuts, which cannot

be trusted for the production of fine timber. Where that is the purpose, it is important to plant the wild type, for which the demand is not such as to encourage nurserymen to stock it. John Evelyn, nearly two hundred and fifty years ago, urged his fellow-countrymen to give more attention to the walnut, but he urged in vain.

"How would such publick plantations improve the glory and wealth of a nation! but where shall we find the spirits among our countrymen? Yes, I will adventure to instance in those plantations of Sir Richard Bidolph upon the downs near Letherhead in Surry; Sir Robert Clayton at Morden near Godstone, and so about Cassaulton [Casehorton], where many thousands of these trees do celebrate the industry of the owners, and will certainly reward it with infinite improvement, as I am assured they do in part already, and that very considerably; besides the ornament which they afford to those pleasant tracts."

It is curious to find Evelyn, who infused a fair proportion of scientific scepticism into his practical treatise, lending credence to some of the mythical virtues of the walnut. Thus he gravely writes that "the distillation of the leaves with honey and urine makes hair spring on bald heads."

In raising this tree from seed the walnuts offered for sale as food should be avoided, for these generally have been kiln-dried, and their vitality, as well as their flavour, thereby impaired or destroyed. Nuts should be selected from large trees of the best habit, laid in sand during the winter and sown in February. They are rather ticklish plants to handle in the nursery, owing to the long bare tap-root which they send down, and which should be shortened when the

seedlings are transplanted, as they should be at a year old. If fine timber be the object, the young trees when planted out should be stimulated to upward growth by the presence of other trees as nurses. A very slight spring frost suffices to destroy the young growth; but the walnut generally escapes that risk by being the latest of all our woodland trees, except the ash, to put forth leaves. I do not remember to have seen the young leaves appear so early as they did in the remarkable spring of 1914, when they were put forth before the end of April; the ash continuing bare that year till the very end of May.

Of the many fine walnut trees scattered over the midland and southern English counties, I have seen none equal in size to one figured in Elwes and Henry's great work (vol. ii., plate 74), a truly noble specimen growing at Barrington Park, Oxfordshire. In 1903 it was between 80 and 85 feet high, with a girth of 17 feet. The bole and branches are covered with burrs, indicating that the timber would make beautiful panelling and veneers.

The only notable walnuts which I can remember to have seen in Scotland are one at Gordon Castle, another at Cawdor, and a third at Blairdrummond. The first of these would have been a magnificent tree had it been subjected to forest discipline in youth, and so expended its vigour in height rather than breadth. It is only 60 feet high, with a girth of 10 feet, but it covers with its huge branches a space nearly 80 feet in diameter. The tree at Cawdor is about 65 feet high, with a girth of 15 feet 7 inches;

and that at Blairdrummond is the tallest of the three, with a girth of 13 feet. Such dimensions cannot compare with those which the walnut attains in Southern Europe. A writer in the *Gardener's Chronicle* described one in the Baidar Valley, near Balaclava, which yields from 80,000 to 100,000 nuts annually, and belongs to five Tartar families, who divide the produce between them.

Still, there are so many fine examples of what this tree may become in Great Britain that one may well ask why the production of its timber has been so utterly neglected. Mahogany and other foreign woods have usurped its place in the cabinet trade; but we still import large supplies of walnut, not only for panelling, but for the stocks of army and sporting small arms. For that purpose it has no equal, owing to its lightness, strength, the nicety with which it can be cut to fit gunlocks, and because it never warps nor swells when exposed to wet. "During the last war," says Selby in 1842, "when most of the continental ports were shut against us, walnut timber rose to an enormous price, as we may collect from the fact of a single tree having been sold for £600; and as such prices offered temptation that few proprietors were able to resist, a great number of the finest walnuts growing in England were sacrificed at that period to supply the trade."[1] Some years ago the War Office authorities sought to extend their sources of supply by substituting one of the superb kinds of timber grown in our colonies;

[1] Selby's *British Forest Trees*, p. 141.

but although twenty different woods were submitted and tested, none was found suitable except the American black walnut.

This (*Juglans nigra*) is a larger tree than the European species, growing to a height of 150 feet with a girth of 15 to 20 feet in the middle States of North America. It has now become very scarce, owing to reckless destruction of the forests; but there are some specimens in England already approaching the dimensions of those in Ohio, Indiana, and Kentucky. For instance, there is one at the Mote, near Maidstone, over 100 feet high, with a girth of 12 feet 6 inches in 1905, and another in the public park at Twickenham, 98 feet high in the same year, with a girth of 14 feet 3 inches. Besides some lofty black walnuts of the ordinary type at Albury Park, Surrey, there is one very handsome tree on the terrace, near the house, distinguished as a variety under the title *J. nigra Alburyensis*.

I do not know of any in Scotland, except a few hundreds which I raised from seed about ten years ago, and which are now planted out in mixture with the Japanese *Cercidiphyllum*. The only fault I find with them is that, while the young growth is as tender as that of the common walnut, it is earlier in starting, and therefore more liable to injury from spring frosts.

The timber of the black walnut is quite equal in quality and superior in beauty to that of the European species. The tree is sometimes confused with the kindred genus hickory (*Carya*), whereof there are

many fine specimens in Great Britain; but the two genera may be readily distinguished from each other by cutting across a twig. The pith of all species of walnut is neatly chambered, that of the hickories is solid.

BLACK WALNUT (*Juglans nigra* var. *Alburyensis*)
AT ALBURY PARK, SURREY
Height 75 ft., girth 9 ft. 6 in.

The Holly

"Heigh-ho! sing heigh-ho! unto the green holly:
Most friendship is feigning, most loving mere folly:
Then heigh-ho, the holly!
This life is most jolly."

IT is rather curious that, dearly as Shakespeare loved the woodland and ready as he ever was to enrich his verse with references to trees and flowers, he never mentions the holly except in this song from *As You Like It.* This is the more remarkable because holly is more widely distributed over Britain than most other forest growths, and must have been far more abundant in the sixteenth century before the land was infested by rabbits to the extent it is now; for these accursed rodents make a clean sweep of holly seedlings and also destroy large trees by barking them.

It may be thought that the holly should be ranked as a shrub rather than as a forest tree; but when well grown it is fairly entitled to the superior rank, for there are many fine specimens in these islands upwards of 50 feet high. Dr. Henry measured one in 1909 near Ampthill, in Bedfordshire, 60 feet

high and 11½ feet in girth. But this tree has no single bole, for it divides into seven large stems at about 18 inches from the ground. A far more shapely specimen is one which Lord Kesteven measured at Doddington Hall, Lincoln, and found in 1907 to be about 50 feet high, with a girth of 9½ feet at breast height. Being very patient of shade, the holly is sometimes drawn up to still greater height than this; Mr. Elwes having found some at Russells, near Watford, crowded among beech trees and rising to 70 and 75 feet.

The most remarkable holly grove known to me is in the park of Gordon Castle, covering a steep bank overlooking what used to be the Bog o' Gicht, but now a fertile holm. It is not known whether these hollies are of natural growth or planted, but they are evidently of great age; indeed, they are mentioned as remarkable in a description of Gordon Castle written in 1760—154 years ago. There are about five hundred trees in the grove, irregularly scattered along the bank, fifty-four of them being crowded into the space of about a quarter of an acre. But alas! one may look in vain for seedlings which might ensure the perpetuation of this ancient grove; all that may spring up are greedily devoured by rabbits.

Talking of seedlings, the propagation of hollies from seed requires to be set about in light of the fact that the seed requires a year of repose before germinating. The readiest way, therefore, is to lay the berries in moist sand for twelve months, after which the seeds may be sown in a nursery bed, where they will soon show signs of life.

The Holly

The largest, though not the loftiest, holly I have ever seen is the remarkable tree at Fullarton House, near Ayr. It stands upon a shaven lawn, which is greatly to the detriment of its nourishment, and it has lost much of its height through decay of the upper branches. But it has a single bole of 8 feet, measuring at the narrowest part, 3 feet from the ground, 11 feet 3 inches in girth. The spread of branches is 189 feet in circumference.

Having been cultivated for centuries as a hedge and shrubbery plant, the holly has sported into a great variety of forms and colours, none of them, to my taste, the match of the wild type for beauty, and some of them mere ugly caricatures thereof. The best variegated forms are of ancient descent—namely Golden Queen and Silver Queen, which are quite as vigorous and bear fruit as freely as the type. These are both very beautiful; as to the other varieties, the world would be no loser if they were all extirpated, unless the quaint little hedgehog holly, described by Parkinson in 1640, were retained as a curiosity. To this doom, however, I certainly would not consign the yellow-berried holly, which gives a fine contrast with the common scarlet-berried kind, and is stated by Cole (writing in 1657) to have been found in a wild state near Wardour Castle. John Evelyn wrote in 1664 of a variety with white berries; Loudon also referred to this, and also to one with black berries; but I have neither seen these varieties nor met with anyone who had. It is doubtful whether both writers have not been misled by hearsay.

The Holly

Evelyn employed all the resources of typography to express his enthusiasm for this fine evergreen :—

"Above all the natural *Greens* which inrich our *home-born* store, there is non certainly to be compared to the *Holly*, insomuch as I have often wonder'd at our *curiosity* after foreign Plants and expensive *difficulties*, to the neglect of the *culture* of this *vulgar* but *incomparable* tree. . . . Is there under *Heaven* a more glorious and refreshing object of the kind than an impregnable *Hedge* of *near three hundred foot in length*, *nine foot high*, and *five in diameter*; which I can show in my poor *Gardens* at any time of the year, glitt'ring with its arm'd and vernish'd *leaves?* The taller *Standards* at orderly distances, blushing with their natural *Coral*. It mocks at the rudest assaults of the *Weather*, *Beasts*, or *Hedge-breakers*."

This hedge grew, not at Wotton, but at Sayes Court, Evelyn's other place near Deptford, which he leased to the Czar Peter the Great in 1697, and had occasion to repent having done so, for that eccentric monarch, in the intervals of his work at the dockyard, amused himself by causing his courtiers to trundle each other in wheelbarrows down a steep descent into the said hedge, which was seriously damaged thereby.

No tree is better adapted than the holly for making a hedge; but it does not always get the treatment necessary to produce the finest effect. I have never seen any to equal the holly hedges at Colinton House, in Mid-Lothian, which were planted between 1670 and 1680, and are now from 35 to 40 feet high, tapering upwards from a basal diameter of about 20 feet. The lower branches have rooted themselves freely, so that it would be difficult to create a more effective barrier of vegetation. The

total length of these hedges is 1,120 feet, having been formed originally with about 4,500 plants. Colonel Trotter's gardener, Mr. John Bruce, takes a just pride in tending them, clipping them annually at the end of March, so as to ensure a close young growth maturing before the winter frosts.

The proper season for planting hollies is May, after growth has started. If the operation is delayed till autumn, they make no new roots, and suffer so much from frost and cold winds that many of them never get established. This is one of those secrets which one has to find out for oneself, at the cost of many wasted seasons. *Haud ignarus loquor.* Although in generous soil the holly will make long annual shoots, it is very slow in forming wood, which may account for our neglect of it as a timber tree. But the wood is of very fine quality, being hard and white, excellent for turnery and for making mathematical instruments.

"We presume," says Phillips in *Sylva Florifera* (1823), "that many noble trees of holly would be seen in this country, but for the practice of cutting all the finest young plants to make coachmen's whips, thus leaving only the crooked branches or suckers to form shrubs." The demand for this purpose must have diminished with the spread of automobilism; but the ravages wrought on holly trees for Christmas decoration are deplorable, raiders finding a ready sale for their plunder in all the big towns. It is a gentle custom to "weave the holly round the Christmas hearth"; but it is desirable that the weavers

should observe some distinction between *meum* and *tuum*—pronouns which they seem to regard as synonymous when applied to holly.

Pliny repeats, without comment, the statement by Pythagoras that the flowers of holly turn water into ice, and, further, that if a man throws a staff of holly at a beast, and misses it, the staff will return to his hand. Here we seem to have a report of the use of the boomerang; but Parkinson, writing in the seventeenth century, expresses lofty disdain for such fables. "This," says he, "I here relate that you may understand the fond and vain conceit of those times, which I would to God we were not in these days tainted withal." The Scottish clans of Drummond and Maxwell of old bore the holly as their badge.

In Lowland Scots the word "hollen" preserves the original English form, which in Ancren Riwle (about 1230) is written "holin," being direct from the Anglo-Saxon "holen, holegn." Chaucer writes it "holm," a form which occurs in such place-names as Holmwood and Holmesdale in Surrey. It is also preserved in the name holm-oak, *i.e.* the ilex or evergreen oak, whereof the young leaves bear holly-like spines. It is an interesting feature in both these trees, as well as in the holly-leaved *Osmanthus*, that the leaves produced above the level of browsing animals are spineless, such defence being needless for the upper branches. This characteristic has been called in question by persons founding their observation upon cultivated varieties of the holly, some of which bear

none but spineless leaves, others none but spined ones. It will, however, be found to be the normal habit in wild hollies.

It is a hazardous thing for a Saisneach to dabble in Celtic etymology, yet will I venture to mention that the Gaelic for holly is *cuileann*, and may be recognised in such place-names as Cullen in Banffshire and Lanarkshire and (aspirated) Barhullion in Wigtownshire. Far seen Slieve Gullion, a cone of the Mountains of Mourne, in Armagh (1,893 feet), is popularly connected with the name of Cuileann, a worker in metals in the reign of Conchobar MacNessa, King of Ulster; but it is written Sliebhe Cuilinn in the Irish Annals, which indicates Holly Mountain as the true meaning. From the same source we are able to interpret Cullen, Cullion, and Cullenach, the names of many Irish townlands, as derived from vanished hollies; and Cuileanntrach Castle, in Meath, destroyed by one Rory in 1155, was so called because of the hollies on the shore.

Pea-flowered Trees

THE enormous natural order of *Leguminosæ* or pea-flowered plants contains many of the loveliest flowering plants in the world, but among them there are but three which, attaining the stature of trees, contribute importantly to the beauty of British woodlands—namely, the common laburnum, the alpine laburnum, and the false acacia or locust tree.

Every country child knows the laburnum, but it is not every planter who recognises that there are two distinct species, bearing a general resemblance to each other, but differing in the time of flowering and in other important respects. The species most usually planted is the common laburnum (*L. vulgare*), and of a truth it would be difficult to name any tree more delectable with its "dropping wells of fire." It is uncertain how early it was brought from Central Europe to Great Britain; Tradescant had it growing in 1596; but if "awburne," mentioned in an Irish Act of Edward IV. (cap. iv., 1464) among the four woods prescribed for the bow with which every Englishman in Ireland was to provide himself, means "laburnum," it follows that this tree must have been

PAGODA TREE (*Sophora japonica*)
IN THE BOTANIC GARDEN, OXFORD

in cultivation from very early times. Indeed, the botanist Matthiolus mentions it as being better even than the yew for bowmaking; and we may recognise the word "awburne" in the old Lowland Scots name for the laburnum, "hoburn saugh," both being from the alternative Latin form, *alburnus*. Gerard called it the bean-trefoil.

There is but one precaution to be observed in planting laburnums—namely, that they should not be within reach of horses or cattle, for the seeds contain a powerful poison called cytisine. Some years ago, wishing to do wayfarers a service by enlivening a stretch of high road, I caused a row of laburnums to be planted on either side. The trees had attained some stature, when a Clydesdale mare belonging to the tenant of a field bordering the road suddenly died, her death being attributed to eating laburnum seeds, so the trees had to be uprooted. Neither leaves nor bark appear to contain the poison, judging from the avidity shown by rabbits in devouring them. No tree is so vulnerable *at all ages* by those detestable creatures as are the laburnum and the holly. The largest stems are liable to be barked by them in hard weather. Some writers have copied Pliny in stating that bees will not visit the flowers of laburnum; but Pliny cannot have been writing from personal observation, for modern bees, at least, show no aversion to the yellow blossoms.

The common laburnum seldom exceeds 30 feet in height. The largest I have seen stands in the laundry yard of Alnwick Castle, over 40 feet high,

wide-spreading, with a double stem measuring over 11 feet in girth near the ground. When Loudon measured it in 1835 the girth was only 6 feet 11 inches. It is a magnificent sight when in bloom. The timber of laburnum, though now greatly neglected in favour of foreign woods, is of admirable quality for cabinet work, being of a dark olive tint, and taking a fine polish. Seeing that the laburnum is perfectly hardy in our climate and grows rapidly in any well-drained soil, it seems a pity that the fine material it produces is not more commonly used.

The alpine laburnum (*L. alpinum*) goes by the name of Scottish laburnum in the nursery trade. Like the common laburnum, it is a native of Central Europe, being, probably, merely the mountain form of the other, to which it bears a strong general resemblance. The readiest means of distinguishing between the two species consists in the foliage and young shoots. In the common laburnum the leaf stalks, young shoots, and under sides of the leaves are thickly clothed with a smooth, silky pubescence, whereas in the alpine species these parts are quite bare, which causes the tree when in leaf to appear of a deeper green than the other. But the important difference for planters is that the alpine laburnum blossoms a fortnight or so later than the common laburnum, thereby prolonging the display of these charming trees. Elwes describes the flowers of the alpine laburnum as being paler in colour than those of the other species; but according to my own observation they are of the richer gold. There are

FLOWER OF LABURNUM

some fine specimens in the Edinburgh Botanic Garden, verging upon 100 years old, about 40 feet high, and now past their prime. The timber is of the same fine quality as that of the common laburnum.

Some beautiful hybrids have been reared between these two species, and planters cannot be too strongly recommended to use them. The variety known as *L. Watereri* bears flower-tassels 15 to 18 inches long. As it is propagated by grafting on the common species, care should be taken not to allow the stock to overcome the scion, root suckers and stem spray being rigidly suppressed.

Another curious hybrid is *L. Adami*, which originated nearly a hundred years ago in a French nursery through engrafting *Cytisus purpureus* on a laburnum stem, with the result that this graft-hybrid produces yellow flowers on some branches and violet ones on others.

Mr. Gerald Loder has secured a charming effect at Wakehurst Place, Sussex, by planting wistaria to grow with laburnum, the flower racemes being similar in size and shape, but respectively of the complementary colours, yellow and violet.

In writing of a beautiful tree as the false Acacia, no reflection upon its integrity is implied in the epithet. The Robinia is so called because Englishmen have chosen to call it an acacia, which it is not, any more than it is a locust tree, as the Americans speak of it. Its scientific title is *Robinia pseudacacia*, commemorating Jean Robin, who first reared it in France in 1601 from seeds sent to him from North

America, where it is very widely spread and much valued for the durability of its timber.

William Cobbett (1762-1835) conceived an extravagant idea of its merits, and predicted that it would supersede all British trees, including the oak; but this expectation has fallen far short of fulfilment. Among many other landowners who were induced to act on the faith of it, Lord Folkestone, a fellow-Radical of Cobbett's, planted 13,000 or 14,000 locusts at Coleshill Park, Berkshire, in 1824; but of these only very few remain now, none of them over 60 feet high. The fact is, the *Robinia* loves more sun than it gets in most parts of our islands and a hotter soil. This renders it unsuitable for planting in Scotland, especially in the humid west. There are, indeed, a few large specimens north of the Tweed, such as one at Cordale House, Dumbartonshire, 64 feet high by 7 feet in girth; another at Mauldslie Castle, Lanarkshire, 60 feet high by 8 feet 7 inches in girth; and, most northerly of all, one at Gordon Castle, which in 1904 measured 56 feet high by 9 feet in girth. But, as a rule, it is only to be found in good form in the sunnier shires; besides, notwithstanding the strength of its timber when felled, the growing boughs are exceedingly brittle, which makes the tree unsuitable for exposure to high winds.

On the sandy soil of parts of Surrey, especially about St. George's Hill, the locust thrives well, reproducing itself freely from self-sown seed, and forming very lovely objects when covered with fragrant white blossoms in June. Even in such parts of England

ROBINIA PSEUDACACIA

At Winchester

where it does best, it is not profitable to let it stand longer than, say, twenty or thirty years, when it makes admirable fencing and gate-posts, which are almost imperishable. At a greater age the trunk becomes coarse and deeply furrowed, often becoming rotten towards the centre. Elwes mentions a locust tree at Frogmore, near Windsor, as the largest in Britain, which he found in 1908 to be 88 feet high by 14 feet 7 inches in girth. One about the same height at Bowood, Lord Lansdowne's place in Wiltshire, was slightly taller, but girthed only 8½ feet.

In France and Italy the locusts thrive as vigorously as in their native continent, and are exceedingly beautiful during the flowering season. They also make very effective hedges, being regularly cut over, when they send up long and strong shoots armed with murderous thorns.

Few trees stand the drought, heat, and smoke of London as well as the *Robinia*, which carries its verdure unchanged long after the limes and elms have become seared and unsightly. Many a time, when Parliament continued sitting through and after the dog days, have I refreshed my eyes by gazing upon a fine *Robinia* which stood at the corner of the late Lord Sefton's house in Belgrave Square. But that tree is no more, for, when the house changed hands after its former owner's death, and was put into the hands of builders and decorators, they felled my friendly *Robinia*.

There are three species of *Robinia* seldom planted in this country—namely, *R. hispida*, *R. neo-mexicana*,

and *R. viscosa*, all with beautiful pink or rose-coloured flowers. Of these, the first-named, a native of Carolina, is the most desirable, but it is even more brittle than the locust or false acacia. Its blossoms are so exquisite as to entitle the tree to the advantage of being trained on a wall.

There are two other trees of the peaflower order which one would fain see more frequently planted in the sunnier districts of Great Britain, namely the Judas tree (*Circis siliquastrum*) and the white-flowered Sophora (*S. japonica*). I happen to be writing within a couple of hundred yards of the finest Judas tree known to me—at Twyford Lodge, near Winchester. It is 35 feet high, and in these early days of May presents a sight which cannot easily be forgotten. The branches, still leafless, are thickly set with blossom; flowers even break out from the old bark on the stem, and the effect of the whole is a dome of soft *vieux rose* (see Frontispiece). It is a native of southern Europe, but agrees perfectly with the climate of England, except in northerly districts which are scant of sun, where it should receive the protection of a wall to encourage the formation of flower buds. The Judas tree (so named from the fond belief that the false Apostle hanged himself thereon) is seldom to be seen in our pleasure-grounds, though it has often been planted there; the reason for this being that it is of slow growth in its early stages, and gets smothered with ranker things, often of less merit.

The Pagoda tree (*Sophora japonica*) is a native of

FLOWER OF ROBINIA PSEUDACACIA

China, where from immemorial time it has been used in medicine, its flowers, seeds and bark being powerfully purgative. Its blossoms appear in August and September, varying in hue from white to yellow, with a tinge of purple. Those which I have seen bear cream-coloured flowers in long, loose panicles, contrasting finely with the dark, pinnate foliage. The tallest specimens I have seen are at Syon House, about 70 feet high. There is also a very large one within the Tilt Yard of Arundel Castle, and Elwes measured one at Cobham Park, Kent, which was 85 feet high in 1905. At page 144 is shown a fine Pagoda tree in the Botanic Garden at Oxford. I do not remember to have seen any specimens in Scotland. Probably the late flowering habit of the tree would not suit the northern kingdom.

The Elder

IN the humid atmosphere of the west there is no more inveterate forest growth than the elder or, as we call it in Scotland, the bourtree (*Sambucus nigra*), which, springing from seeds which birds, having stuffed themselves with the sweet berries, distribute far and wide, shoots up with amazing rapidity, indifferent as to sun or shade, for it grows happily under dense forest canopy, although it is only in the open that it makes full display of its great discs of cream-coloured flowers.

From the earliest times there have been two schools of opinion about the elder. Pliny put faith in decoction of its leaves as a febrifuge, and in his day malaria was a terrible scourge in Italy. In 1644 appeared a book entirely devoted to its virtues—*The Anatomie of the Elder*, translated from the Latin of Dr. Martin Blockwich by C. de Iryngio; and thirty years later John Evelyn burst into a coruscation of italic type in praise of this humble tree.

"If the *Medicinal* properties of the *Leaves*, *Bark*, *Berries*, &c., were thoroughly known, I cannot tell what our *Country-man* could aile for which he might not fetch a *Remedy* from every *Hedge*, either

for *Sickness* or *Wound*. The inner *Barke* of *Elder*, apply'd to any *burning*, takes out the *fire* immediately. *That*, or in season the *Buds*, boyl'd in Water-grewel for a *Break-fast*, has effected wonders in the *Fever*; and the *decoction* is admirable to asswage *Inflammations* and *telrous* humors, and especially the *Scorbut*. But an *Extract* or *Theriaca* may be compos'd of the *Berries*, which is not only efficacious to eradicate this *Epidemical* inconvenience, and greatly to assist *Longevity* (so famous is the story of *Nœander*), but is a kind of *Catholicon* against all infirmities; and of the same *Berries* is made an incomparable *Spirit* which, drunk by itself or mingled with *Wine*, is not only an excellent drink, but admirable in the *Dropsy*. . . . The *Oyntment* made with the young *buds* and *leaves* in *May* with *Butter*, is most soveraign for *Aches*, shrunk *Sinews*, *Hemorrhoids*, etc."

And so on and so on, much in the strain of modern advertisement of patent medicines. The boot is on the other leg now, for although hot elder-berry wine glows comfortably in memories of boyhood, I know not where I might now get a glass thereof, were I to perish for want of it.[1] Thoughtful housewives still provide elder flower water on the toilet tables of their guests, and methinks the ointment may be found in some conservative nurseries.

Contemporary with mediæval esteem of the elder was the belief that it was accursed because it was the tree whereon Judas hanged himself. We know, of course, that in Southern Europe the beautiful Judas tree (*Circis siliquastrum*) is stained by that imputation, but Sir John Mandeville (fourteenth century) assured his countrymen that he had been shown at Jerusalem the identical "Tree of Eldre" on which

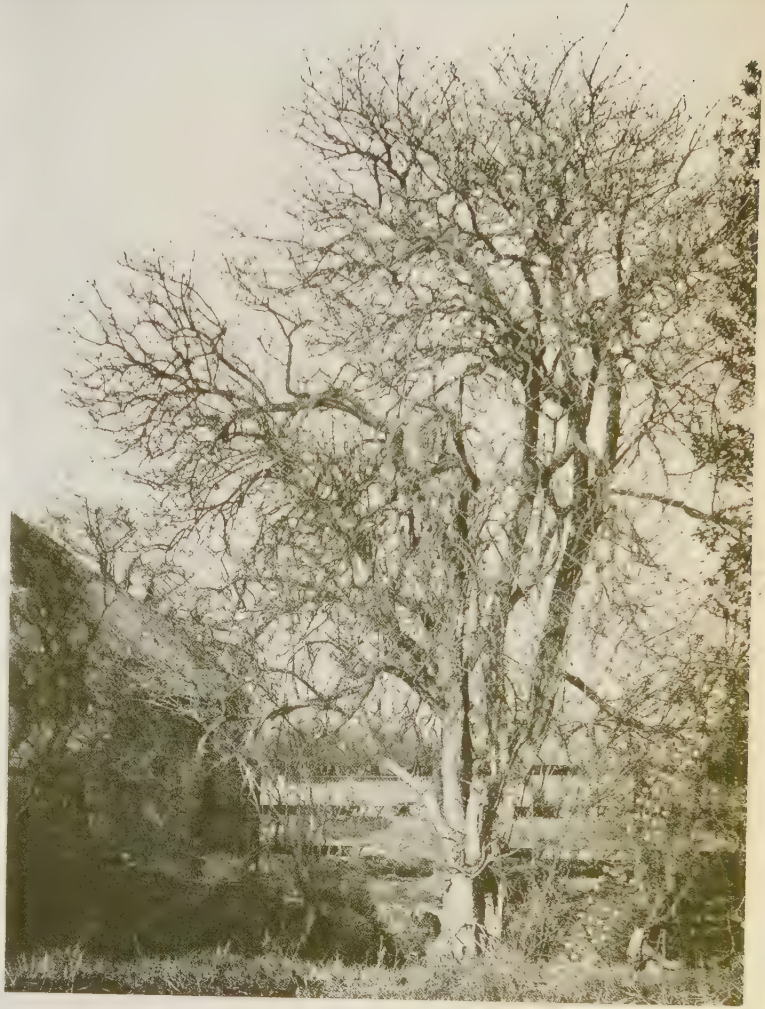
[1] Since writing this I have received from a friendly correspondent a bottle of elder-berry wine, and must confess that I conceived no desire for a second bottle.

the traitor ended his career. The chief reason for hesitating to accept Mandeville's evidence is that he never, or hardly ever, told the truth except by accident. Shakespeare, however, entertained the belief, for in *Love's Labour's Lost* he makes Biron say to Holofernes, "Judas was hanged on an elder," and science has lent assent to the rural fancy which gave the name Jew's Ears to the flabby black fungus that makes the elder its peculiar host by calling it *Hirneola auricula-Judæ.*

The pith which bulks so largely in the young growth of elder ceases to increase after the second year, and becomes compressed, and the wood that forms round it is exceedingly hard. In old times it was much in request for making pipes and other musical instruments. Pliny has preserved a quaint bit of folk-lore about it. He says the shepherds believe "that the most sonorous horns are made of an elder growing where it has never heard a cock crow." In our day we put the wood to no use whatever, unless, in the West of England, butchers still use it for skewering meat, which it was supposed to guard from taint. But—

> No sound shall creak through the solemn pines,
> The ocean shall lose its roar,
> The wild horse cease to skim the plain,
> The alpine peaks be level again,
> The eagle forget to soar,

before our boys forget the simple craft that turns whistles and popguns out of elder shoots. For this, and certain other qualities, the elder claims a per-



In June — ELDER (*Sambucus niger*) — In December

manent place in our affection. It never winces or complains under the harshest phases of our climate, and it forgets its melancholy at midsummer, when an old bourtree, 30 feet high or so, set with scores of creamy saucers, is a really beautiful object.

The elder has given names to many places in our land. In the Cornish dialect of Celtic, now extinct, it was called *scau* and *scauan*, and is preserved in Tresco, Boscawen, Penscauan, etc. In old Celtic it was *trom*, genitive *truim*, whence, as we learn from the Book of Armagh, the town Trim, in Meath, was formerly *Ath-truim*, the elder ford. Galtrim, in the same county, appears in the annals as *Cala-truim*, the meadow of the elder. Trimmer, Trummer, and Trummery are Irish place-names, all perpetuating the memory of *tromaire*, an elder wood. The Truim, a principal tributary of the Spey, probably was originally Amhuinn Truim, the elder river. In the Scottish lowlands we find Bourtriehill, Bourtriebush, etc., while in England it is difficult to distinguish "elder" in composition from "alder." Skeat suggests the two words are of identical origin, and in each the *d* is intrusive. Elderfield, a parish in Worcestershire, Ellerby and Ellerton in Yorkshire bear a pretty clear stamp.

The Hazel

TO admit the hazel to rank among forest trees may seem like magnifying a molehill into a mountain; but it was a growth so important to the primitive community, as the only native tree contributing to winter provender, that it would be ungrateful to omit it. I was greatly impressed by this fact when, many years ago, we were exploring "crannogs," or lake dwellings, in the south-west of Scotland, in all of which nut-shells were found in quantity.

One instance was particularly remarkable. Dirskelvin Loch, a small sheet of water in Old Luce Parish, contained a very large crannog, built, as we roughly calculated, with between 2,000 and 3,000 trees. The loch having been drained away, we proceeded to exfodiate the crannog. In going along what had been the north-east margin of the vanished loch, I found it deeply covered with hazel-nut shells—many, many cartloads of them. Evidently they were kitchen waste from the crannog, drifted to that quarter before the prevailing south-west wind.

If the reader does not consider that the food it

produces justifies admission of the hazel among forest trees, let him meet me at Merton Parish Church, on Tweedside, turn off the main road to the left at Clint Mains, and, as we travel towards Bemersyde, he shall see in the road fence on his right hand a row of hazels which it would be a misuse of terms to style bushes. Speaking from recollection, they stand about 25 feet high, with single stems that must girth not less than 18 inches to 2 feet. The fact is, the hazel does not often get a chance of attaining its full stature, being commonly cut for copse or treated as undergrowth.

He, however, who aims at growing hazel timber need not waste time in educating our British *Corylus avellana*, but plant the Turkish hazel, *C. colurna*, which is perfectly hardy in our climate. It is represented by very few specimens in these islands, albeit it was grown in England as "the filbeard of Constantinople" so long ago as 1665. The finest trees of this species are at Syon House, Brentford, the tallest of which was 75 feet high in 1904, with a girth of 6 feet 9 inches, and a clean bole of 30 feet. The timber is said to have a beautiful texture, pinkish white, and sometimes grained like bird's-eye maple. French cabinetmakers import it under the name of *noisetier*.

Returning to our native hazel, we no longer depend upon its fruit to sustain us through the winter, though large quantities of the cultivated varieties, filbert and cob-nut, are still grown in Kent for the market. Of the wood, it can only be said that it produces excellent walking-sticks, and has no equal

in hurdle-making. Modern anglers have no use for it, preferring greenheart and split cane, though of old it was considered a *sine qua non* for rod-making. Thus the author of *The Boke of Saint Albans* prescribes :

> "Ye that woll be crafty in anglynge, ye must fyrste lerne to make your harnays, that is to wyte your rodde. . . . And how ye shall make your rodde crafty here I shall teche you. Ye shall kytte betwene Myghelmas and Candylmas a fayr staffe of a fadome and an halfe longe, and arme grete, of hasyll, willowe, or aspe."

The prescription goes on for drying, straightening, and boring out the middle of the staff, and then—

> "In the same season take a fayr yerde of grene hasyll and beth hym evyn and streyghte, and let it drye with the staffe, and whan they ben drye make the yerde mete into the hole in the staffe, unto halfe the length of the staffe. . . . And thus shall ye make you a rodde soo prevy that ye may walke therewyth, and there shall noo man wyte where abowte ye goo."

Seeing that the staff was to be "a fadome and an halfe longe" (9 feet), and as thick as his arm, the wayfarer's progress might not be so "prevy" as is set forth if water bailiffs were on the lookout!

AILANTHUS GLANDULOSA
At Wadham College, Oxford

The Ailanto

IN many southern parts of the British Isles *Ailanthus glandulosa* has attained forest stature; but it seems to require more sunshine than it can receive in the average Scottish summer. Loudon, indeed, mentions one at Dunrobin, in Sutherland, which was 43 feet high about eighty years ago; but I have found no trace of that tree in the woods there. There used to be one at Syon 100 feet high, but this has been dead for some years. Elwes and Henry have recorded several in the home counties measuring from 70 to 80 feet in height. Dr. Henry found it wild only in the mountains of Northern China. Elsewhere in China it is cultivated to support a certain species of silk-worm (*Attacus Cynthia*); also a drug is prepared from the root bark; but its timber is regarded as fit only for firing, although in this country it has been found serviceable by wheelwrights. It is said to resemble ash, but is of inferior toughness and elasticity.[1] He, therefore, would be acting very unwisely who, having land suitable for ash, should devote it to growing Ailanthus. Indeed the tree,

[1] *Trees of Great Britain and Ireland*, p. 34.

though handsome and hardy, would hardly deserve attention from British planters, were it not for its admirable fitness for street planting. Except the plane, no forest growth adapts itself so generously to the arid heat, the drought and noxious air of London. For this purpose, it is important that, as the Ailanthus is diœcious, only female trees should be planted; the males exhaling a disagreeable rammish odour. I have never been in Northern China, but I cannot conceive that the splendid pinnate foliage of this tree can be more luxuriant in its native forest than it is in a few of the driest, dustiest London thoroughfares.

The habit of the tree in this country tends to forking, probably because the leader is apt to be nipped by late frost; wherefore, to secure a shapely specimen, timely use of the knife is necessary; which attention, to judge from the trees I have seen, is very seldom paid to it.

The Pines

EXCEPT the birch, the Scots pine (*Pinus sylvestris*) is more widely distributed over northern Europe than any other species of tree, and it shows more indifference than any other to variations of climate. While in Eastern Siberia it sustains without flinching a temperature of 40° below zero (Fahr.), it thrives in Southern Spain under a summer heat of 95°. It seems as much at home in the sun-baked region of Southern France as it is in the perennially humid atmosphere and cool soil of Western Scotland and Ireland.

Yet there are limits to its cosmopolitan endurance. Not long ago I spent a profitable day in the Arnold Arboretum at Boston, Massachusetts, under the guidance of its presiding genius, Professor C. S. Sargent. After wandering for hours amid the luxuriant vegetation of that magnificent park, we stopped beside a mangy, stunted conifer, and he asked me whether I recognised it. I did not; but guessed at hazard that it was the Japanese *Pinus parviflora*. I was surprised to be told that this was the best that could be done in that country with our own Scots pine.

From causes difficult to define, probably similar to those which prohibit the growth of our common ivy in the Eastern United States, this tree resists all attempts to make it at home in that atmosphere.

It may seem strange that this tree should be known as the Scots pine, having regard to its enormous geographical range and to the insignificant area which it occupies in Scotland as compared with the vast forests in Russia, Scandinavia, and other countries. Its scientific title, *Pinus sylvestris*—the forest pine—would appear more appropriate. But it has received its English name because, although at one time it was spread as a native over all parts of the British Isles, it is now only to be found in a truly wild state in the fragments of old forest remaining in Strathspey, Deeside, and here and there in the counties of Inverness and Perth. From England probably it had entirely disappeared when, in the seventeenth century, certain landowners succeeded in reintroducing it; and now it has attained splendid proportions in Surrey and other southern counties, and spreads freely by its winged seeds wherever these fall on unoccupied lands. Were it not for deer, sheep, and rabbits, most of our *dry* moors and heathland would be covered with pine forest up to the thousand feet level. Howbeit, most of the moorland in the United Kingdom is the reverse of dry. Except in Eastern Scotland and the Surrey uplands, it is usually clad with a dense coat of wet peat, reeking with humic acid and inimical to tree growth of any kind. One of the darkest enigmas of natural science is presented in the remains of pine

SCOTS PINE WOOD

forest buried under such a dismal treeless expanse as the Moor of Rannoch, and on Highland hills up to and beyond 2000 feet altitude, far higher than any tree can exist now. The explanation seems most likely to be arrived at in the direction indicated by certain symptoms of the alternation of periods of greater and less rainfall—periods comprising thousands, perhaps tens of thousands of years. Trees, it has been suggested, might grow and reproduce themselves at high altitudes during the drier cycles; but when the rainfall and atmospheric humidity increased beyond a certain degree, the soil would become covered with moss, seedlings would be smothered or never start, and humic acid would render the ground unfit for any growth except heather and moorland herbs.

Diligent collectors and enterprising nurserymen have ransacked the remotest forests to furnish British woodlands with profitable timber-producers and British pleasure-grounds with ornamental trees; yet among all the scores of exotic conifers which have taken kindly to our ocean-girt land, the Scots pine, in my judgment, need fear no rival in beauty after reaching maturity.

It is not a little remarkable, considering how well adapted our moist climate is for evergreen growth, that the Scots pine and the juniper should be the only two conifers indigenous to Britain since the glacial age. (The yew used to be classed as coniferous, but has now been removed to a separate order.) The Norway spruce, as shown by remains in pre-glacial

deposits in Norfolk, once flourished in our land; but it has never recovered a footing there since the severance of Britain from the Continent.

No tree shows a greater difference than Scots pine in the quality of its timber at different stages of growth. Unlike larch, which yields useful and durable wood from a very early age, Scots pine is very soft and perishable until the tree approaches eighty years old. It is true that young deals and posts may be rendered serviceable by boiling in creosote; but it is not until the tree reaches maturity that the timber becomes valuable, without that treatment, for anything except pit-props.

In 1783 Alexander, fourth Duke of Gordon, sold a great breadth of the pine forest of Glenmore to an English merchant, who took twenty-two years to fell it. The logs were floated down the Spey, and built at Speymouth into forty-seven ships of an aggregate burthen of 19,000 tons. When Mr. Osborne, the purchaser of the timber, finished his work in 1806, he sent a memorial plank to the Duke, which now stands in the entrance hall of Gordon Castle. It measures 5 feet 5 inches in width at the butt end, and 4 feet 4 inches at the top, and is of a rich dark brown colour. The top of this magnificent tree lies where it was cut off more than one hundred years ago, on the hill above Glenmore Lodge, 1400 feet above the sea, and is still hard and sound, 3 feet in diameter where it was cut off. Now, had that been part of a tree, say, fifty years old, frost and wet would have rotted it to the core in ten years or less; but the

snows and rains of a century have made little impression on the bones of this giant. Mr. Elwes was shown a tree in the King's Forest of Ballochbuie, on Deeside, which had been cut up after lying for seventy years where it fell, yet the timber was quite sound.

Age apart, the value of Scots deal varies much according to the manner in which it is grown. It is not the most picturesque pines that yield the finest timber ; for the result of growing singly or in scattered groups is a spreading branchy habit, causing coarse, knotty wood. Enormous quantities of Scots pine from Scandinavia and pinaster from France, twenty to thirty-five years old, are imported into Great Britain for pit-props. These might be just as well grown in the British Isles, to the great advantage of rural employment ; but British foresters are only now beginning to understand the economic management of timber crops. The great majority of woodlands in these islands have been ruined by over-thinning. Welsh mineowners decline to use the knotty British-grown pines so long as they can get clean-grown French timber.

Happily, a better understanding of the principles of economic forestry is being arrived at in this country, so that more satisfactory results may be expected in the future. Scots pine should be grown in close canopy—that is, with a continuous cover of foliage throughout the wood—until the trees are seventy or eighty years old. By that time long, clean boles will have been formed, and the forest may be dealt with

according to the views of the owner, whether his object be profit or beauty; for, unlike the oak, the Scots pine may be isolated from his fellows after reaching maturity without suffering in constitution.

The mildness and humidity of the British climate are unfavourable to the production of the best quality of deal, promoting, as they do, over-rapid growth and, in consequence, wide annual rings in the stem. The forester's object should be to check this by growing the trees so close that increase of trunk diameter may be retarded, and the annual rings crowded into small space until the trees are near maturity. That is the secret of the superior quality and durability of Russian and Scandinavian deals over all but the finest British pine.

Amateurs in landscape object to the scientific treatment of pine forest, complaining that it creates a tiresome monotony. It is quite true that a plantation of Scots pines of middle age is not an interesting subject of contemplation, except to foresters. Nevertheless, it is half-way to what may become one of the most impressive scenes in nature. The most beautiful tract of Scots pine forest I have ever seen is that which clothes the slopes of the Wishart Burn, near Gordon Castle. This was planted about 180 to 190 years ago, and it is evident that the trees have gone through strict discipline of close company in early life, for their trunks are lofty, perfectly clean and even, carrying their girth well up to the branches at 50 or 60 feet from the ground. The tallest tree measured by Mr. Elwes in this wood seven years ago was about

FLOWER AND FRUIT OF SCOTS PINE

117 feet high, with a girth at breast height of 1 inch short of 11 feet. He estimated that it contained 345 cubic feet of timber. Many of the trees in this wood have been felled; but there remain about sixty to the acre—say, 6000 cubic feet per acre. They would be easily saleable standing at 6d. a foot, or £150 per acre.

As for landscape beauty, it would be difficult to imagine a fairer woodland scene than is composed by this company of aged pines. They do not stand so close now as to prevent one "seeing the wood for the trees"; the sun rays penetrate freely among the stately stems, which have that peculiar bloom of pearly rose that distinguishes the bark of old Scots pine. Aloft, the light flashes on the brighter hue of ruddy boughs supporting the massive foliage; below, the undulating ground, steep and rocky in places, is clothed with bilberry, fern, and other lowly growth. There is nothing gloomy or dreary in the scene, which he who visits it will not readily forget.

In Gaelic the name for the pine is *giuthas* (pronounced "gewuss," with a hard *g*). As is usual in the case of native trees, this word may be identified in many place-names both in Scotland and Ireland; albeit, sometimes pretty well disguised in modern orthography. Guisachan and Kingussie may be recognised pretty easily, the latter being *cinn giuthasaich*—"at the end or head of the pine wood"; but it requires some smattering of Gaelic speech to avoid the ornithological suggestion conveyed in the name Loch Goosie, in Kirkcudbright, and to interpret it correctly as "the loch of the pine wood."

I have remarked above that a mature Scots pine has no rival in beauty in the genus, and indeed the charming outline, blue-green foliage, ruddy branches and roseate grey trunk of a well-grown Scot of 150 years' growth can admit no superior in comeliness; but, on second thoughts, I must admit that it has a dangerous competitor in the Monterey pine (*P. radiata* syn. *insignis*). Native of an extremely limited range on the Californian coast, the first seedlings were raised in England in 1833. There are now several specimens recorded as over 100 feet in height. In rapidity of growth it excels all other pines, at least in the moist climate of the British Isles. One which I planted in 1884 at Monreith was blown down in 1911, and was found to be 61 feet 6 inches in height, with a girth of 5 feet 4 inches, certainly a remarkable growth in 27 years. If the timber were of a quality proportioned to the rapidity with which it is produced, the Monterey pine would indeed be a valuable tree, but our experience of it in this country differs in no respect from Sargent's report, viz. "Wood light, soft, not strong, brittle, close-grained." If it were grown in sufficient quantity it might prove good for pulping, but it is of no other economic value. Moreover, this pine is only suitable for the milder parts of the United Kingdom—the south and west coasts of Great Britain and the whole of Ireland. Almost the only exception known to me is a tree at Keir, in Perthshire, which in 1905 was about 70 feet high, with a girth of 11 feet. This must be an individual of exceptional hardihood, for in most inland districts,

except in Ireland, the Monterey pine has succumbed to frost. In maritime districts it is a most desirable tree, affording splendid shelter and gladdening the eye with its rich foliage of deep but brilliant green and rugged, massive trunk.

To describe, however briefly, all the exotic pines that have been successfully grown in the British Isles would fill a volume in itself. I cannot do more or better than refer the reader who desires the fullest information about them to the great work of Elwes and Henry wherein all particulars are given of about fifty different species. Yet I cannot refrain from mentioning one European species which I regard as qualified in large measure to supplant the Scots pine as a commercial asset in British woodland. I refer to the Corsican pine (*P. laricio*) and its varieties which, despite the insular title popularly given to the tree, cover a range extending from southern France and Spain to the Caucasus. Among these varieties, late authorities include the Austrian pine (*P. austriaca*), which, if it be botanically identical with the Corsican, is of very inferior merit for British planters. In extreme exposure it forms good shelter, but its habit is coarse and roughly branching, very different from the fine columnar growth of the Corsican. Moreover, there is this singular distinction between the two trees—one of no slight importance to foresters in our rodent-ridden land—that whereas hares and rabbits greedily devour young Austrian pines, they never touch the Corsicans; at least I have never known them injure one of tens of thousands which I

have planted, though I have heard of newly-planted trees being attacked elsewhere under extreme stress of hard weather.

Dr. Henry has given a very full description of the pine forests of Corsica,[1] whence it appears that, owing to the excess of sapwood, the timber is of little value till the trees are 200 to 300 years old, at which age the trunks average only 3 feet in diameter. A forest tree which develops so slowly is not likely to find much favour with British foresters; and the fact that this pine grows faster in our islands than on its native mountains certainly does not lead one to expect a high quality of timber. I have, however, cut poles of Corsican pine thirty years old to support the galvanised roof of a hayshed. They averaged 8 inches in diameter at 5 feet from the ground, and were undoubtedly larger and finer than Scots pine of the same age growing among them, which I should never dream of using for such a purpose; but, as the shed has only been standing for three or four years, it is too early to regard this as a test. The merits of this pine already ascertained in this country are resistance to wind exposure, straight and rapid growth, and immunity from damage by ground game. These qualities render it most valuable for planting mixed with other trees, for which purpose I consider it superior to Scots pine. It requires, however, more considerate nursery treatment, for its root system is straggling; and planting out should be delayed till the middle of April and carried on till

[1] *Trees of Great Britain and Ireland*, ii. 411–417.

the middle of May. Observing this rule, I have found the percentage of loss after planting to be trifling, certainly not greater than with Scots pine; but the results are not so satisfactory in southern England on hot soils. The Corsican pine, however, demands all the light it can get, being extremely impatient of shade, whether overhead or alongside.

The great expectations formed about the Weymouth pine (*Pinus strobus*) when it was brought to England early in the eighteenth century have not been fulfilled. Known as the white pine of the North American lumber trade, it received its British designation from the extent to which it was planted by Lord Weymouth at Longleat. It is true that many fine specimens exist in several parts of these islands, notably that which was blown down in 1875 near Tortworth in Gloucestershire, measuring 122 feet high with 46 feet of clean bole; but as a forest tree it has never taken high rank with us, perhaps because, generally grown as a specimen, it has not been subjected to forest treatment, and the quality of the timber is ruined by the uprush of a number of competing tops. It was his habit that disfigured a Weymouth pine at Dunkeld which I measured in 1902 and found to be 13 feet 3 inches in girth at 4 feet from the ground, the clean bole being about 30 feet. I think this tree has since been blown down.

Far superior to the Weymouth pine in erect habit is the Western White pine (*P. monticola*), which, in other respects, resembles the other very closely. This would be a most desirable tree for use as well as orna-

ment, but that it has proved susceptible to attacks of the rust-fungus (*Peridermium strobi*), an organism which requires to pass alternate generations on *Ribes* (currant). A number of fine *P. monticola* in the famous woods of Murthly, some of which were over 80 feet high in 1906, have perished under the agency of this parasite. On the west coast, however, this fungus does not seem to have made its appearance. Of two trees of this species which I planted in 1876, believing them to be Swiss stone pines (*P. cembra*), one is now a straight, shapely tree 57 feet high, with a girth of 5 feet 4 inches at 5 feet from the ground; and both have produced plenty of seed whence a large number of seedlings have been planted out.

No notice of the Pines, however fragmentary and superficial, could be justified if it did not include a reference to the Pinaster or Cluster Pine (*Pinus maritima*). British tourists on their journey to or from Biarritz, Pau, etc., can scarcely fail to have noticed the immense plantations of this tree through which the railway runs between Bayonne and Bordeaux. For nearly 100 miles the woodland is well-nigh continuous, consisting almost exclusively of this species, and covering an area of nearly two million acres "perhaps" says Mr. Elwes, "the most extensive forest ever created by the hand of man." Estimating the capital sunk in planting, road-making, etc., since 1855 at upwards of £2,000,000, M. Huffel put its value in 1904 at £18,000,000, the annual revenue from timber, turpentine and resin being then more than half a million sterling—equal to a

rent of about 7s. an acre. In a wild state, the landes thus occupied were practically worthless for agriculture.

Although the pinaster is a native of the Mediterranean region, it agrees admirably with the soil and climate of the British Isles, thrusting its boughs out in the teeth of severe wind exposure, growing to great height and bulk and ripening abundant seed. Yet it is a despised tree with us, few landowners being at pains to plant it now, although a considerable number seem to have been planted about the end of the eighteenth century and early in the nineteenth.

The Silver Firs

WHILE the wide range of the English language over the globe is of considerable advantage to commerce, and possibly to some other interests, it is the source of some perplexity when, as in treating of natural history or botany, precise terms have to be employed. Thus in the United Kingdom most people know exactly what tree is meant by the silver fir; but in the United States, with a population well on to double that of the British Isles, the silver fir is understood to mean quite a different species—namely, *Abies venusta*, a native of California, not suitable for forestry purposes in this country. In like manner, though there is no true cedar indigenous to America, there are half-a-dozen trees there known as red cedar, white cedar, and so forth. English, being a living language, is still fluid; meanings shift with changes of environment; to secure precision, therefore, science must have recourse to classical Greek and Latin, which, being dead languages, change no more.

The group of evergreen conifers, then, collectively known as silver firs, consists of about thirty species

comprised in the genus *Abies*; and these are most easily recognised by the position of the mature cones, which stand erect on the branches, whereas in the other group of true firs, the spruces (*Picea*), they are pendulous in all except two or three Asiatic species. Another mark of distinction is the circular base of the needle or leaf, which, when it falls or is pulled from the branch, leaves a perfectly circular scar; while in the spruces the leaves are set upon little pegs which remain on the twig when the leaves fall. The grey or silvery bands on the under side of the leaf, although it is from these that the tree is called the silver fir, are not an exclusive badge of the genus; for some of the other firs, notably the Manchurian spruce, display similar colouring.

The tree known in this country as the silver fir *par excellence* (*Abies pectinata*) is the loftiest European tree. Probably the extreme height had been attained by one grown in a Bosnian virgin forest, measured by Mr. Elwes after it had fallen, "over 180 feet long, whose decayed top must have been at least 15 or 20 feet more."

The silver fir is not a native of Britain, having been introduced about the beginning of the seventeenth century. Its range extends over southern and central Europe, from the Pyrenees on the west to the borders of Wallachia on the east. Nevertheless, it has found a congenial home in these islands, where, if it had ever received scientific handling, it would have been far more highly esteemed for its timber than it now is. Such handling we have never given it; the silver

fir has been used indiscriminately in mixed plantation, where, outstripping every other tree in stature, it loses its leader, and sends up a number of heads which get battered by the wind, becoming ragged and unsightly.

Now if these noble firs, instead of being scattered among trees of inferior height, were planted in close forest, so as to be drawn up with clean boles to a single leader, they would protect each other from the gale. Then might be seen something of the true character of the silver fir as it is developed in such forests as that of the Vosges, in Eastern France, where a tract fifty miles long is clad principally with this species, or in the Jura, where a forest of silver fir 10,600 acres in extent yields annually 170 cubic feet of timber per acre felled. British foresters and wood merchants set a low value on such timber as the silver fir produces in this country; and small blame to them, because, grown as we are in the habit of growing it, branchy and full of great knots, it is almost worthless; but in some districts of Europe where silver forest is well managed and felled in rotation, the deals are more sought after and command a readier market than spruce. The thinnings make excellent pitwood, and although, like spruce, the timber is not naturally durable enough for outdoor purposes, it can be made so by creosote treatment.

The silver fir sows itself very freely in places where the ground herbage is not so rank as to choke the young plants; but to allow natural reproduction a fair chance, ground game must be rigorously excluded,

SILVER FIRS (*Abies pectinata*)

for deer, hares, and rabbits seem to regard this delicacy in much the same light as human beings do asparagus. This tree—*Abies pectinata* (I must resort to Latin to distinguish it from the other European, Asiatic, and American silvers) differs from every other member of the genus (so far as my observation goes) in being a shade-bearer; that is, it will grow under the shade and drip of deciduous trees, so dense as to be fatal to the health, and generally to the life, of every other conifer except the juniper. This renders it of almost unique utility for under-planting, the beech being its only rival for that purpose. It is true that the Douglas fir and the giant Thuja both stand a considerable amount of side shade, but the silver fir thrives under conditions of overhead drip which the others cannot suffer. One may read in books on forestry that the Norway spruce is patient of overhead shade; I can only say that, though I have sought diligently for an instance of its doing so, and have seen many thousands of spruce planted in faith of this misleading advice, I have never found a case where the attempt has succeeded.

In planting silver firs it is important to take advantage of their power of bearing shade, for the young trees are very susceptible of injury by late frost, from which older and taller woodland will protect them. It is remarkable how long and patiently the young silvers so treated will wait for head-room —marking time, as it were, till the older crop is cleared away, when they will go ahead and occupy the ground.

The Silver Firs

The silver fir is more exacting in the matter of climate than in that of soil. The great forest of the Vosges is chiefly on silicious ground; but that of the Jura, which is even finer, grows on limestone. The great silver firs at Rosneath, probably the oldest in the United Kingdom, stand near the sea level in deep sandy soil. They are certainly over 200 years old, the largest being about 110 feet high and 22 feet 7 inches in girth. These trees are very massive, and branch into great heads owing to their not having been grown under conditions of close forest. The only rival in bulk to them is to be found at Ardkinglass, on Loch Fyne, about 120 feet high, and estimated to contain over 1,000 cubic feet of timber.

In many places on the south and east coasts the silver fir does not thrive. It requires an abundant rainfall and a moist atmosphere, which probably accounts for its inability to stand the climate of the Eastern United States. There are, however, some fine specimens in Sussex (at Cowdray there is, or was a few years ago, a silver fir over 130 feet high, with a clean bole of 90 feet), and at Alnwick, in Northumberland: but at Novar, so famous for coniferous trees, Sir Ronald Munro Ferguson has given up planting it owing to its inability to resist the attacks of aphis. This seems to indicate a constitution impaired by climatic influence, for insect parasites, though they certainly hasten the death of a weakly subject, are not likely to prevail over a thoroughly vigorous one. In Western Scotland, where, as in Ireland, the silver fir makes grand growth, aphides

swarm immediately upon any tree that has been debilitated by late frost or other injury. On the other hand, the Caucasian silver fir (*Abies Nordmanniana*), which thrives splendidly in many parts of Britain where the common silver cannot be grown, frequently succumbs in the west to the attacks of aphis. At Benmore, on the Holy Loch, about 2,000 acres were planted about forty years ago with different kinds of conifers. I have examined the lists of the species planted, and find that by far the largest proportion consisted of this Caucasian fir. The forest remains, a splendid monument to its designer's enterprise; but hardly a Caucasian fir is to be found in it. The prevailing species are Douglas fir and giant Thuja.

Dr. Stewart M'Dougall has made some useful research, leading him to identify the silver fir aphis with *Chermes abietis*, the spruce louse which, as explained when treating of the larch, migrates to the larch and produces parthenogenic generations thereon. Dr. M'Dougall traces the silver fir louse to the same parentage. It follows from this that the spruce is a dangerous neighbour to silver firs.

Less serious, because not hurtful to the general health of the tree, is the "witch's broom" which forms upon the silver fir, sometimes greatly disfiguring it. This is caused, or at all events accompanied by, a fungus (*Æcidium elatinum*), which passes one phase of its existence upon certain humble herbs of the Pink family, such as the mouse-ear chickweed and sandwort.

The Silver Firs

For purposes of timber probably the common (*A. pectinata*) and the Caucasian silver fir (*A. Nordmanniana*) are the pick of the genus, but there are also many other species of singular beauty. Their beauty, indeed, especially in a young state, has proved somewhat of a snare, inducing people to plant them in gardens and pleasure-grounds where they soon outgrow their environment, and, being isolated from their kind, are apt to send up many leaders and so forfeit their true character. Several years ago I was staying in a country house in the south of England, where a royal personage was paying a visit. It was arranged that the said personage should plant a memorial tree; a site was selected on a close-shaven lawn, and I could not but deplore the tree chosen for the honour. It was perhaps the least majestic of all the silver tribe, namely, the Spanish fir (*A. pinsapo*), a species which seldom responds freely to the conditions provided in this country, and, when it does so, is of gloomy appearance.

The largest silver fir in the world is the North American (*A. grandis*), which in a young state might easily be mistaken for *A. pectinata*, but soon exhibits its true nationality by the extraordinary rapidity of its growth. It races upwards at the rate of three feet a year, and, distancing all surrounding growth, suffers the penalty inevitable in our stormy climate, unless it should be provided with shelter from a sufficient company of its peers. At the Avondale School of Forestry *A. grandis* is reported to be less liable to injury from spring frost than the common

silver fir. No doubt there are spaces in the wilder parts of this island where this grand tree might be grown into splendid forest, but as an isolated specimen it can never develop its true dimensions, which are out of all proportion to our native woodland. The timber is neither strong nor durable; indeed, of the nine species of North American silver firs, Professor Sargent reports favourably in this respect upon one only, *Abies nobilis* to wit, a tree of which, personally, I have formed a very high opinion for the climate of the northern and western parts of the United Kingdom. It has suffered in reputation with many experienced planters, owing to a liability to lose its leader when it outgrows its surroundings, as it very speedily does; but, as in the case of the common silver fir, that is the consequence of bad forestry; if *A. nobilis* were planted in masses, the trees would protect each other. No forester can look unmoved at the group at Murthly in Perthshire, several of which are well over 100 feet high. This fir is also exceedingly ornamental in a young state, some of the seedlings from every sowing having foliage with a lovely glaucous bloom. *A. magnifica* and *A. amabilis* are not easily distinguished from *A. nobilis* in a young state, until cones are produced. They are beautiful, but comparatively useless trees, and there are no specimens in this country approaching the dimensions already attained here by *A. nobilis*.

Of the Asiatic silvers I will mention but two, both from the Himalayas. *Abies Pindrow*, a beautiful tree of columnar growth and fine glossy foliage, has proved

quite hardy in Britain. The finest specimen I have seen is at Gordon Castle, Banffshire, about 70 feet high and a picture of health. *A. Webbiana* is a tree of wider spread than *A. Pindrow*, and excels all other silvers in its splendid foliage, two broad white bands on the under sides of the large needles thoroughly justifying the epithet "silver." When the boughs are set with great violet-blue cones this tree is indeed a beautiful object. Individuals of this species vary a good deal in their endurance of British climate, at least in the west. Its tendency to early growth renders it very vulnerable by spring frosts, and when it has been debilitated by the destruction of the young growth, it falls a prey to the attacks of aphis.

The Spruce Firs

WHEN a British forester talks of a spruce fir he may be understood to refer to *Picea excelsa*, commonly known as the Norway spruce, although in fact much of the Norwegian spruce forest is composed of the Siberian spruce (*P. obovata*), a species closely resembling the other, but incapable of thriving in the moist and relatively mild climate of Great Britain.

The so-called Norway spruce is not a native of the British Isles, its natural range extending from the Pyrenees on the south to Scandinavia on the north, and eastward through the Carpathian Mountains to Western Russia; but, next to the Scots pine and larch, it is the conifer most commonly seen in British woodland, and, where undergrowth is not too rank, it may reproduce itself from self-sown seed. It has, indeed, been far too extensively planted with us, probably owing to its cheapness and easiness to handle. It is only to be found well developed in inland districts, such as the valley of the Tay and Deeside, where it forms really fine forest, and where noble specimens may be seen.

At Blair Atholl there was a grand spruce blown down in 1893, measuring 142 feet in height and containing about 420 cubic feet of timber. There are still many lofty spruces in the woodland about Dunkeld and Dupplin, containing well-grown, clean timber, and Messrs. Elwes and Henry have recorded a number of trees in various parts of the United Kingdom from 130 to 150 feet high. As a rule, however, in this country spruce, even when the requisite shelter has been secured, is not grown under sufficiently strict forest conditions to produce the best deals; it is commonly raised in mixed plantations, wherein, being patient of side shade, it retains its branches, a habit that renders the timber coarse and full of knots.

Probably the most successful result from a plantation of pure spruce in Scotland was that obtained on the estate of Durris, on Deeside, where the trees on 400 acres were sold standing at 60 years old, the average number of spruce per acre being 560. As the average contents per tree were 10 cubic feet, and the price realised was 5d. per foot, the value amounted to £116 per acre.

It would be vain to expect any such return from spruce planted in such situations as are frequently given to it. In a seaboard exposure it is worse than useless, for no tree becomes more unsightly than a spruce under the influence of salt-laden winds. For such situations, if spruce be grown of any kind, there are other species likely to give better results. I shall name two of these presently, but, first, it may be mentioned that the genus *Picea* consists of two dis-

DOUGLAS FIRS (*Pseudotsuga Douglasii*)
PLANTED AT TAYMOUNT IN 1860

tinct groups—first, the true spruces, distinguished by having four-sided needles; second, the Omorika spruces, which have flat, two-sided needles. Inasmuch as some species of the second group have silvery under-sides to the needles, they are apt to be mistaken for some kind of *Abies*, or silver fir. Here, again, the needle serves to distinguish between them, for, as aforesaid, in the spruce family the needles are set on little peg-like projections on the twig, whereas in the silver firs there is no such projection, but each needle when pulled off leaves a circular scar.

There are probably upwards of twenty species of true spruce, including the Norway spruce. Some of them well deserve attention from the arboriculturist, being exceedingly ornamental, such as the Himalayan Morinda (*P. Smithiana*), first raised from seed at Hopetoun House, Linlithgowshire, in 1818, and now flourishing in various parts of the United Kingdom at a height of 70 to 80 feet, with handsome pendulous branchlets.

About Waterer's glaucous variety of the Colorado spruce (*P. pungens*), there is current an amusing account of its introduction to this country some five-and-twenty years ago. The late Mr. Anthony Waterer was an enthusiast in his calling as a nurseryman. A traveller came to him one day with a bag of seed which he said came off the bluest fir he had ever seen. "How much do you want for the bag?" asked Anthony. "Two hundred pounds," was the reply. "Oh! go along with you," exclaimed Anthony, "d'ye think I'm made of guineas?" The man departed, but left

Anthony with his mouth watering (no pun intended) for the blue fir. He sent after the traveller, paid him his price, and sold thousands of the seedlings at half a guinea apiece. I cannot vouch for the truth of detail in this narrative, but the tenour thereof is quite in accord with Mr. Waterer's enterprise in his business.

Beautiful as some of these true spruces are, it is not among them that the forester need look for a substitute for the Norway spruce; but there are two at least in the other group which bid fair to oust it from its undeserved predominance in our woodlands. The first of these is the Sitka spruce, formerly known as the Menzies spruce, and still appearing in some trade catalogues as *Abies Menziesii*, though now recognised by botanists only as *Picea Sitchensis*. This grand tree, which in Oregon has been known to tower to the height of between 200 and 300 feet, has proved to be admirably suited for forestry purposes in the United Kingdom. It is a moisture lover, thriving in soil too wet and sour for any other conifer, and as it grows right down to the coast in Northern California and Alaska, it does not share the dislike of the Norway spruce for the breath of the ocean. This spruce, having been introduced to this country in 1831 by David Douglas, has been long enough with us to prove its quality, and there are many in the three kingdoms 100 feet high and upwards. Probably the largest in these islands is one at Castle Menzies, in Perthshire, which in 1904 measured 110 feet high and 13 feet 2 inches in girth at a height of 5 feet, having been

CONES OF NORWAY SPRUCE (*Picea excelsa*)

planted in 1846. The timber is suitable for similar purposes to those served by Norway spruce; but the strong tendency of this tree to side-branching makes it essential that it should be grown close in pure forest in order to produce clean deals.

The other tree in the Omorika group which probably has a commercial future in this country is the Manchurian spruce, *Picea Ajanensis* or *Jezoensis*. I do not know that this tree is stocked by nurserymen in this country, but seed can be obtained from Continental merchants, and I am induced to speak favourably of it from the behaviour of about one hundred plants which I put out about twelve years ago. In the nursery it bears so close a resemblance to the Sitka spruce that it is difficult to distinguish between the two species until the plants are three or four years old; but after that age they differ markedly in foliage and habit of growth, the Manchurian spruce being less inclined to branch outwards than the Sitka and has no tendency to the characteristic of dropping its needles which is apt to disfigure the American species. In the forests of Yezo (the northern island of Japan) this spruce is reported as growing to a height of 150-200 feet. Its growth with me is extremely vigorous, and it seems to enjoy a maritime climate, which the Norway spruce does not. Like all the spruces, this tree is well adapted for the manufacture of wood pulp and celluloid.

I cannot part from the spruce family without going back to the square-needled group in order to commend the Caucasian spruce (*Picea orientalis*) as

an ornamental tree. The slowness of its growth compared with that of the Sitka, Manchurian, and Norwegian spruces may be thought detrimental to its value to British planters for profit; but the grace of its outline, and the fine, rich green of its shining foliage render it one of the choicest of conifers. In the Caucasus it rises to a height of 180 feet, with a girth of 12 feet; and in the British Isles, whither it was first brought in 1839, there are many specimens between 60 and 80 feet high.

The name "spruce" has an interesting origin, about which some controversy has been waged. From the fourteenth to the sixteenth century Spruce occurs in English literature as an alternative form of Pruce—that is, Prussia. The Prussians were then distinguished among the nations as great dandies. The chronicler Hall, in describing the splendid attire of some of Henry VIII.'s courtiers, observes that "they were appareyled after the fashion of Prussia or Spruce." Hence "spruce" came to be a synonym for "smart, finely dressed"; and some etymologists have argued that the spruce fir means the Prussian fir; but this has been shown to be an error. The tree takes its name from the sprouts, called *sprossen* in German, whence is distilled the essence of spruce, used in brewing *sprossen-bier* or spruce beer. So the tree came to be termed in German *sprossen-fichte*, translated into English spruce-fir, though we do not brew spruce beer. Therefore the name does really come to us from Prussia, though not in the manner supposed by the older etymologists.

The Spruce Firs

This digression into etymology brings to mind another word connected with the spruce fir, namely "deal," which owns to one of the most remarkable etymologies in our language. Although it has not been traced to its original root, it exists in all branches of Teutonic speech, always in the sense of a share or division. It also occurs in Gaelic as *dal*, signifying a portion of land, as Dalnaspidal—the land portion of the hospital; Dalrymple (*dal chruim puil*, the farm of the crooked pool—on the Doon), and so on. The Anglo-Saxon *dœl* meant a portion, a share; whence we use the word in phrases such as "a deal of cards," "a great deal,"[1] and have applied it to express the planks into which a tree is "divided," or sawn up. From a Scandinavian source we get another form of the word "dale," meaning a valley, as Tweeddale, Annandale, etc.; for in Norway one dale or valley is "divided" from another by mountains.

[1] A "dole" (in charity) is merely a dialectic variant of "deal."

The Cedar

"The cedar stoops not to the base shrub's foot,
But low shrubs wither at the cedar's foot."
Shakespeare's *Lucrece*, 664.

THE frequency with which Shakespeare mentions the cedar can only be explained as the action of a far-ranging intellect, beholding things through the eyes of travellers, and weaving hearsay into vivid imagery. He had, indeed, scriptural authority for assigning to the cedar royal pre-eminence among trees.

"Behold, the Assyrian was a cedar in Lebanon with fair branches. . . . the cedars in the garden of God could not hide him; the fir trees were not like his boughs, and the chestnut trees were not like his branches, nor any tree in the garden of God was like unto him in beauty. . . . So that all the trees of Eden that were in the garden of God envied him." (Ezekiel, xxxi., 3, 8, 9.)

But Shakespeare himself never set eyes upon a cedar: for Evelyn, writing fifty years after his death, could but deplore that there were no cedars in England—"I conceive," says he, "from our want of industry." He says that he had raised seedlings, perhaps from the first cones brought to this country.

Howbeit, once this noble tree was established with us, it throve amain, and it is now as familiar an adjunct to English manor houses as the yew is to churchyards.

In Scotland it is not so often seen, more's the pity, for the fine specimens at Hopetoun House, Biel, Moncrieff House, Dupplin, and Mount Stuart, ranging from 64 to 88 feet high, with girths of from 13 to 23 feet, testify to its acceptance of northerly conditions. The largest cedar recorded by Elwes is a splendid specimen at Pains Hill, near Cobham, which in 1905 measured 115 feet high, with a girth of 26 feet 5 inches. Like most of its kind in Great Britain, this tree, having been planted for ornament, has been allowed room to throw out mighty side branches; but the cedar can be made to develop lofty, clean boles if grown in close canopy, such as one at Petworth, in Sussex, which in 1905 was 125 feet high, 14½ feet in girth, with a straight trunk clear of branches to a height of 80 feet, save for one small branch that has grown out at 56 feet from the ground.

Having regard to the fine quality of the timber, it is to be regretted that more attention has not been given to growing cedars under forest conditions. The nearest approach that I have seen to this treatment is in the fine cedar avenue at Dropmore, Bucks, where a large number of trees, close planted about seventy years ago, have grown straight and fair to a height of as many feet.

A few years ago, when the Duke of Northumberland was having some trees felled on Solomon's Hill

in Albury Park, a lofty cedar, whereof he had never suspected the existence, was revealed. Forest discipline had cleared the magnificent bole of branches to a height of fifty feet, and fifty more must be added as the probable height of the tree, which, owing to the nature of the ground, cannot be accurately ascertained.

In regard to the timber, the value whereof for building caused the Israelitish Kings to levy such severe tribute from the forest of Lebanon, what is produced in the humid atmosphere of the British Isles is not so hard and durable as that grown in the Orient; but it is extremely suitable for panelling and other indoor work, being of a delicate pinkish hue, fine in grain, and beautifully figured. There is no regular market for it in Britain, but the opportunity not infrequently occurs of securing the trunk of blown trees, and ought not to be lost. If one goes into the market to buy cedar wood, what is likely to be supplied is not coniferous wood at all, but that of *Cedrela odorata*, a West Indian tree belonging to the natural order *Meliaceæ*. On the other hand, the scented wood used for pencils comes from the so-called pencil cedar, which is not a cedar, but a juniper—*Juniperus Virginiana*—a tree of columnar habit and slow growth, perfectly hardy in this country, and very ornamental.

The late Sir Joseph Hooker visited the cedar grove on Mount Lebanon in 1864, and found about 400 old trees producing plenty of seed, by which the forest would soon regenerate itself if the ground were

protected from goats, which devour every seedling. Besides this grove at the head of the Kedisha Valley there are four others in the Lebanon district, the largest of which, at Baruk, was reported in 1903 by Dr. A. E. Day as containing many young trees; but the older trees were being recklessly hacked for fuel and house timbers. Besides the Lebanon groves, which are specially interesting from their connection with biblical history and the prodigious age of some of the trees, there are extensive forests of *Cedrus Libani* in the Taurus Mountains, where the winter is very severe.

In Britain this tree responds to excess of moisture by growing far more rapidly than in its native forests; and, notwithstanding that exaggerated views are entertained about the age of certain specimens, it seems certain that it never will attain with us anything approaching the age of the patriarchs of Lebanon. Assuming that none were planted in Britain before the middle of the seventeenth century, and that very many have died, showing all the signs of senile decay, we cannot calculate on a duration of life exceeding 250 years, or rather more than the normal life span of the beech and ash.

Fifteen years ago or so I was appointed to represent the Privy Council on a Committee formed to take over the Chelsea Physic Garden from the Apothecaries Company. One of the first problems that presented itself was how to deal with an aged cedar of Lebanon that stood in the grounds. Probably it was one of the oldest in Great Britain, for it was one of those mentioned by Sir Hans Sloane in 1685

as having been planted in the Physic Garden, but the dwellers in Chelsea had conceived a fabulous estimate of its age, and, although it was stone dead, the mere whisper of the need for removing it sent a wave of indignation through the neighbourhood. Howbeit, the dead tree was an eyesore and a harbour for woodlice and other pests, so it had to go. It was felled and taken away; but in deference to popular feeling this was done under cloud of night!

The cedar of Mount Atlas (*C. atlantica*) was pronounced by Sir Joseph Hooker to be, like the Indian deodar (*C. deodara*), really no more than a geographical and climatic variety of the cedar of Lebanon; but whereas the difference in habit and appearance is well marked and constant, modern classifiers have assigned each of the three specific rank. For the British planter the distinction between them is of considerable importance. The Mount Atlas cedar, which forms great forests in the mountain ranges of Morocco and Algeria at high altitudes, is far more erect in growth, and has less tendency to wide branching, than the cedar of Lebanon. The glaucous variety, with foliage of a charming silvery bloom, is one of the loveliest conifers that can be planted, provided it is raised from seed; but nothing except disappointment is prepared for those whom nurserymen supply with plants raised from cuttings or grafts, which are invariably lacking in the graceful carriage and erect habit which distinguish this species among all other cedars. There is the less excuse for propagation by these means, inasmuch as the Atlantic cedar ripens

its cones in our country as freely as the Lebanon cedar, and seed gathered from glaucous parents will produce a considerable proportion of seedlings with the hereditary tint.

The cedar of Mount Atlas was not introduced to England until about 1845, but there are already many handsome specimens, measuring 50 to 80 feet high. The tallest I have seen in Scotland is at Smeaton-Hepburn, in East Lothian, which was 69 feet high and 6½ feet in girth in 1902.

The deodar, *C. deodara*, may be distinguished at a glance from either of the other forms of cedar by the graceful drooping of the young growth. A native of the Western Himalayas, at altitudes from 4,000 to 10,000 feet, it has not adapted itself very successfully to our mild, restless winters and cool summers, the very reverse of its native climate. It grows in its own country to an immense size, 150 to 250 feet high, and as much as 35 feet in girth, with long clean boles. Elwes records how a fallen deodar lay for at least one hundred years in one of the leased forests of the North-West before it was cut up, when it sufficed for 460 railway sleepers, narrow gauge.

Deodar seed was first sown in Britain in 1831, at Melville in Fife and Dropmore in Bucks. Ten years later large quantities were raised and planted in the New Forest, but so many of these died without apparent cause between the ages of forty and fifty years that their cultivation there has been discontinued. Similar results have been experienced elsewhere, so it does not seem that this tree, however

desirable as an ornamental species, can ever be of importance for forestry in the United Kingdom. Moreover, it is not so hardy as the other two cedars, many having succumbed in all parts of the country during the severe winter of 1860-61. There are, however, many fine specimens in the southern counties of England and in Ireland, ranging from 75 to 85 feet high. In Scotland, Elwes has recorded nothing taller than a tree at Smeaton-Hepburn, which measured 55 feet high in 1902. There are several of about the same height at Galloway House in Wigtownshire.

On the whole, the best species of cedar for planting in this country, whether for timber or ornament, is the cedar of Mount Atlas.

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LARCH IN SPRING

LARCH FLOWERS (Male and Female) AND CONES

The Larch

THE European larch was known in England fully one hundred years before it arrived in Scotland, having been introduced into Southern Britain early in the seventeenth century. But it was long before this tree was grown except for ornament and by those curious in exotics; it was John Evelyn who first drew attention to the value of its timber, upon which he reported very favourably after seeing it in Continental forests. Writing in 1678, he refers to one growing near Chelmsford, "arriv'd to a flourishing and ample tree, [which] does sufficiently reproach our negligence and want of industry"—for not planting more larches.

The introduction into Scotland of the larch, the most valuable of all European conifers, was delayed a full century after the tree had become known to English planters. When it did come, it opened a new era in the forestry of that country; and, if credit may be given to local traditions, its coming was not devoid of romance.

Among the other resources of the northern realm, which had been sorely exhausted during three cen-

turies of war with England, Scottish woodland, once so rich and extensive, had well-nigh disappeared, and so bare was the country that when Dr. Johnson made his tour in 1773 he declared that in the whole of it he only saw three trees big enough to hang a man upon.[1] Nevertheless, after the Legislative Union in 1707, landowners very generally set about planting on their estates, none of them more diligently than James, second Duke of Atholl, who received from a neighbour returning from the Continent the present of a few seedling trees which he had brought in his portmanteau from the Tyrol. It is said that these were given to the gardener, who tried to grow them in a greenhouse. Having languished under such unsuitable conditions, the plants were thrown out upon the rubbish heap, where two of them, reviving in the free Highland air, took root and grew vigorously.

The date of this incident is variously given between the years 1727 and 1738; anyhow, there the pair of "Mother Larches" stood, close to the west end of Dunkeld Cathedral, until 1909, when the larger of them was destroyed by lightning, after attaining the age of 170 years or thereby. It measured 102 feet high, with a girth of 15 feet 1 inch at 5 feet from the ground, and contained about 530 cubic feet of splendid timber.

The Duke of Atholl was so well pleased with the growth and appearance of these two trees, and of three others of the same age, which, I believe, are still standing at Blair, that before his death in 1764 he had

[1] One of these, a sycamore at Ellon, was blown down in 1873.

wholly altered the appearance of the landscape by planting many square miles of hillside with larch. His example was followed by other landowners, so that during the nineteenth century larch was planted in greater quantity than any other tree, except perhaps Scots pine, for it was found that, owing to the durable character of the wood even in trees from ten to twenty years old, the thinnings of a larch plantation were serviceable and readily saleable.

Unfortunately, it became the practice to plant larch and Norway spruce in mixture. No more mischievous combination could have been devised, owing to a peculiarity in the life history of the spruce-gall aphis (*Chermes abietis*), a plant louse which bores into the buds of young spruce and lays eggs therein, causing the tree to throw out a cone-like gall from the site of the puncture. This gall is the nursery whence issues a swarm of sexual and sexless aphides. The sexless form has wings, and, alighting on a larch, speedily lays numerous eggs, which in turn are hatched into minute sexless lice, each with a coat of white down, easily detected as snowy dots on the foliage. In a few weeks these creatures acquire wings, and, despite their sexlessness, lay fertile eggs, successive swarms being produced till the fall of the leaf. Feeding by suction of the juices in the leaves, these creatures seriously, often fatally, reduce the vitality of the tree, the foliage appearing as if blighted by frost.

It must be admitted that this diagnosis of the life-history of the spruce and larch louse is to some extent

tentative. It is true that no instance is recorded of the male *Chermes* being found on the larch, and it is also true that, as stated by Elwes, larches are often infested with *Chermes* where there are no spruces near.[1] But it is well known that many, if not all, of the *Aphidæ* multiply by parthenogenesis (that is, without the intervention of the male), and although it has not yet been ascertained that this can be continued for more than four years,[2] that is a period quite long enough to allow of the swarms inflicting deadly injury to any tree not in the most robust health.

Now, whereas larch and spruce may often be found growing together in natural woods on the continent of Europe, it may be asked why the result of planting them together in British woods should be attended with such evil consequences. The explanation is to be found in the climatic conditions to which the larch is exposed in these islands. Naturally a mountain tree, in regions where a high summer temperature, long and strong sunshine, with little rainfall, but with much subterranean moisture from melting snow, promote vigorous growth, to be followed by total rest during severe winter weather, the larch meets in Britain with the reverse of these conditions—namely, a cool, cloudy, generally wet, summer, and an open and still wetter winter. The wonder is that the tree can adapt itself to the change as well as it does; there can be no doubt that its constitution does

[1] *Trees of Great Britain and Ireland*, Vol. ii. p. 363.

[2] David Sharp in *Cambridge Natural History*, Vol. vi. p. 583 (1899).

not remain so well able to resist attack by insect or fungoid parasite. Nature, which is ever as solicitous to provide for the perpetuation of what we consider ignoble vermin as she is for that of more admirable forms of life, has adapted the spruce-gall for a dual existence upon two species of tree growing in company; but she has also endowed these trees with a constitution vigorous enough not to suffer materially from the presence of the parasite. When that constitution becomes impaired by unnatural conditions of climate and environment, the parasite gets the upper hand, just as lice multiply upon a diseased bird or mammal. In the case of the larch, the mischief does not end with the aphides.

Another enemy lies in wait for the tree that has been weakened by loss of its sap. A minute fungus (*Dasicypha calycina*), gaining access by its spores through any lesion of the bark, causes that incurable ill known as larch canker, which has now become so generally spread through British woodlands as to cause many landowners to give up planting larch at all. In this case, also, we have a parasite which may be found on larches in their native forests, but which the inherent vigour of the trees keeps in check. That this is the true and only reason for the excessive prevalence of larch canker in this country, causing incalculable pecuniary loss to many owners of woodland, is shown by the behaviour of the Japanese larch (*Larix leptolepis*). The fungus may easily be found upon this species; but so great is the vigour of the young trees that the fungus exists, and no more.

The tree repels the inroads of mycelium into its tissues affording the invader foothold merely as a harmless guest.

Serious doubts are entertained as to whether the Japanese larch will prove as valuable a tree commercially as the European species; it has not been grown long enough in Britain to prove its quality as a timber producer. But the extraordinary rapidity and vigour of its growth in early years, its beauty and the readiness with which it takes hold when planted out, have induced many people to discard European larch in favour of this Asiatic species. Travellers in Japan report that the larches of that country never attain the bulk and stature of European larches; but it does not follow from this that they may not do so in this country. The holm oak, more commonly known as ilex, is a native of the hot and dry Mediterranean region, yet what is probably the tallest specimen in the world is growing in the moist atmosphere of County Wicklow. So with the horse chestnut, only to be found wild in a few spots in Macedonia and Asia Minor, lands which can show none to equal the noble trees of this species at Bushey and elsewhere throughout the British Isles.

Meanwhile, the lesson of our experience is that we must still treat the European larch as a foreigner of great distinction. Let it never be exposed to contact with the Norway spruce, a useful tree in its way, but, commercially, not half the value of larch. Let it not be planted as a pure crop, but let it be mixed with other trees, as it is usually found in a wild state.

There is no better companion for it than the beech, none, indeed, equal to that beneficent tree, owing to the manner in which it screens the soil from evaporation and radiation, and refreshes it with an abundant annual leaf fall. Finally, let the utmost care be bestowed upon the critical operation of planting; see that in removal from the nursery the roots are not suffered to get dry, as they often become when sent to a distance by rail; and let these roots be fairly spread in the pit dug for them, instead of being rammed in a bunch into a mere notch in the ground, as is too often done. It is worth much effort to retain such a desirable denizen of our woodlands in health and vigour.

Attention has been drawn within the last few years to the Western Larch (*L. occidentalis*) of North America, a tree which Douglas found in British Columbia in 1826, and mistook for *Larix Europœa.* It has now, however, been recognised as a distinct species, the mightiest of the genus, reaching a height of 180, perhaps 200 feet.[1] In habit and outline it is very different from the European larch, still more so from the Japanese species, for the side branches, though horizontal, are short, which gives the tree a fine columnar habit. Owing to the great height of the trees in Montana and British Columbia, and to the cones opening and scattering the seed as soon as ripe, it is difficult to collect a supply of seed, which can only be done from trees in September. Dr. Henry visited Montana in the autumn of 1906 on

[1] Professor Sargent says, "sometimes 250 feet high."

purpose to obtain a supply. Unluckily, very few cones were formed that year; but a good supply was obtained in 1907, whereof I was given some. It germinated freely; the seedlings grew as rampantly as those of Japanese larch, forming beautifully rooted plants; I cleared the hardwood off three acres of good land, and planted it with 12,000 western larch, fine rooted plants, in the spring of 1910. The result has been discouraging; about 50 per cent. died outright, and by the end of 1914 the remainder have made poor growth. On the other hand, a dozen seedlings which Mr. Elwes sent me, raised from seed in 1904, and planted on moist but well-drained bottom land, have grown fast and well, being now 14 to 18 feet high. Evidently this tree, like the Sitka spruce, requires moist deep land; the other place, though far from being poor, was not wet enough for it.

There are three specimens of the western larch at Kew, one being 34 years planted and about 35 feet high; but the soil of Kew is too dry to nourish without much coddling a tree whereof all reports go to show that it demands so much moisture at its roots as would be fatal to the European and Japanese species. Sheltered valleys on the western side of Great Britain seem to be the likeliest environment for the development of this most valuable timber tree, and probably nearly all parts of Ireland.

The Yew

WHAT the ash was to the Scots of old, the yew (*Taxus baccata*) was to the English; for while the ash furnished staves for the national weapon, the pike, which the Scots learnt to handle from their Flemish allies, the most powerful longbows were fashioned of yew, and it was as archers that the English excelled all other infantry until gunpowder came into general use. Even long after the smoke and stench of "villainous saltpetre" had altered the conditions of battle, much attention was given to archery in the English army. Despite the many Acts of Parliament enjoining the planting of yews, the supply had run short before Queen Elizabeth came to the throne, so that in 1571 it was enacted that bow-staves should be imported from the Continent (13 Eliz., c. xiv.).

Apart from military association, the yew is a tree of gloom, taking the place in British churchyards which the cypress, "like Death's lean lifted forefinger," occupies in Eastern cemeteries. Tennyson was least likely of poets to miss the significance of this tree's melancholy; at first he could

recognise in it nothing else but that and its changelessness :

Old yew, which graspest at the stones
  That name the underlying dead,
  Thy fibres net the dreamless head,
Thy roots are wrapt about the bones.

Oh not for thee the glow, the bloom,
  Who changest not in any gale !
  Nor branding summer suns avail
To touch thy thousand years of gloom.

Shakespeare received a similar impression :

But straight they told me they would bind me here
Unto the body of a dismal yew.

Sir Walter Scott applied the self-same epithet :

But here 'twixt rock and river grew
A dismal grove of sable yew.

. . . . .

Seem'd that the trees their shadows cast
The earth that nourished them to blast ;
For never knew that swarthy grove
The verdant hue that fairies love ;
Nor wilding green, nor woodland flower,
Arose within its baleful bower.
The dark and sable earth receives
Its only carpet from the leaves.

Anyone who has stood on a summer noon within one or other of the two remarkable yew woods on Lord Radnor's property near Salisbury cannot fail to recognise the truth of this picture in every detail. The sense of gloom and envious shade in those "swarthy groves" must oppress him who enters it. They are known respectively as "the Great Yews"

FRUIT OF YEW (*Taxus baccata*)

and "the Little Yews," the former being of the greater extent—about 80 acres—but the largest trees are growing in the Little Yews. Although these two woods are almost certainly of natural origin, traces of replanting may be recognised here and there by the regular lines in which some of the great trees are disposed, telling of a time when the timber was in request for bowmaking.

Tennyson came to realise that the yew really responds in its own fashion to the summons of spring as briskly as any rose or lily, and that a sparrow cannot alight upon it in April without disturbing a puff of pollen :

> Old warder of these buried bones,
> And answering now my random stroke
> With fruitful cloud and living smoke,
> Dark yew, that graspest at the stones
> And dippest toward the dreamless head,
> To thee, too, comes the golden hour
> When flower is feeling after flower.

Surely there is nothing more delightful in English verse than the delicate phrase in which Tennyson touches upon some of the less obvious workings of nature.

Evelyn observes regretfully in the seventeenth century : "Since the use of bows is laid aside amongst us, the propagation of the eugh is likewise quite forborn ; but the neglect of it is to be deplored." Howbeit, on the whole, one cannot regret that this sombre tree is less often planted than it was when the Kings of England were striving desperately to retain their

rich lands in France. The yew requires two or three centuries to acquire dignity. Such venerable ruins as the great yew in the churchyard of Leeds, in Kent, measuring 32 feet in girth at 3½ feet from the ground, command admiration akin to awe from creatures whose span is but three-score years and ten. So do the yews on Merrow Down, near Guildford, reputed to have marked the Pilgrims' Way to Canterbury; and the yews of Borrodale and Inch Lonaig, on Loch Lomond, we cherish as traces of the primæval forest. But for decorative work, for sheltering hedges in garden and pleasure ground, let us take some more lightsome evergreen from the wealth of choice that the enterprise of collectors has furnished us withal. The Lawson cypress, the giant thuja, the so-called Albert spruce, and many others, are of far nobler growth than the yew and equally patient of the shears, if clipped they have to be. True, they are foreigners, but so are the Spanish and horse-chestnuts, the silver fir, the sycamore, the English elm, and many other growths which have become integral parts of our home landscape; assuredly our forbears would not have hesitated to plant better things than yews if they had been given the chance. That they did plant what they had may be seen from the note made by Giraldus Cambrensis when he visited Ireland in the year 1184:

"Here the yew with its bitter sap is far more abundant than in all the other countries where we have been, but chiefly in old graveyards; and of these trees you may see plenty planted of old in these sacred places by the hands of holy men who did what they could to honour and adorn them."

THE EARL OF RADNOR IN HIS YEW GROVE NEAR DOWNTON, WILTS

Given elbow room, the yew takes liberal advantage of it, and is apt to spread to a breadth equal to or greater than its height. A singular departure from this habit was made by a seedling found in 1767 on the hills near Florence Court, in County Fermanagh, which grew in a strictly fastigiate or columnar form, and became the progenitor (by cuttings) of what is now known in all temperate parts of the globe as the Irish yew.

Geologically the yew is of immense antiquity in this island; indeed, it grew in what is now the island of Britain before that was severed from the Continent, as is proved by its remains in the forest bed underlying the glacial drift on the coast of Norfolk, where its fruits, identical with those of the present time, have been recognised lying among the bones of elephant, rhinoceros, and four species of bear. A closely kindred form of yew, with somewhat smaller seeds, has been found in the German coal-fields, showing that the type has existed from an incalculably distant period, before the formation of the chalk. Botanically, therefore, the yew must be regarded as contemporary with such archaic types of vegetation as the Gingko, the Umbrella pine (*Sciadopytis*), the Cycads, and the Horsetails.

Of the age of individual trees exaggerated estimates have been formed and statements devoid of evidence made. Thus a fine yew at Yew Park, Clontarf, near Dublin, is confidently shown to visitors as that under which Brian Boruimh, King of Ireland, died on Good Friday, A.D. 1014. Very likely he

breathed his last under a yew tree growing on that spot; but it is incredible that this should be the identical tree, for although it has a wide spread of branches, the trunk only measures 12 feet in girth. Compare this with the recorded increase of a yew at Ankerwyke, near Staines, which in 1822 girthed 27 feet 8 inches, and in 1877 had increased to 30 feet 5 inches, and it is clear that the Clontarf tradition cannot be seriously entertained.

It would grievously wound the feelings of a townman of Chichester to express any lack of confidence in the tradition which affirms that the yews in Kinglye Bottom, near that town, were growing there when the Norsemen landed among them a thousand years ago; but listen to Dr. Lowe's chilly analysis of the grounds for that belief. "Had it been said that yews were there, the statement would have been accurate; but that 'the yews,' meaning those still existing, were then in being, is too large a demand on our credulity, as there is no tree at that place which exceeds 15.4 feet in girth, or possibly about five hundred years in age."[1] In like manner the belief that Montrose rested under the fine yew at Abercairney, in Perthshire, must be dismissed, for it only girths 10 feet 7 inches, indicating an age of about 200 years; whereas to have afforded effective shelter in the year 1640 it ought by this time to be at least 370 years old.

The usual indication of age by annual rings of

[1] *The Yew Trees of Great Britain and Ireland*, p. 60, by John Lowe, M.D., 1897.

growth cannot be trusted in the case of the yew, owing to a peculiarity in its habit of growth. Injury to a main branch often causes all that part of the stem with which it is connected to die under the bark right down to the ground, the injury being repaired by a rush of young shoots from the living bark; and these, if they get head room, grow vigorously and ultimately become welded together. This process vitiates the record of annual rings, and although it is a means of rejuvenescence which no doubt prolongs the life of the tree, it would not be safe to assume that there is any yew in the British Isles more than five hundred years old. Dr. John Lowe was at great pains to collect evidence on this matter, and failed to obtain *documentary* proof of any yew exceeding 250 years of age.

The practice of planting yews in churchyards helps to account for the extravagant statements about the age of certain trees. Generation after generation has become familiar with seeing a yew beside the parish church; the date of the building of the church being accurately known, it comes to be assumed that church and tree are coeval. Dr. Lowe gives a case in point of two churches in contiguous parishes in Kent, each of which has a large yew in the churchyard reckoned to be the same age as the church. One of these yews measures 16 feet in girth, the other 17 feet; but as one of the churches dates back to the eleventh century, and the other only to the fourteenth, the tradition about the trees would have one yew to be three hundred years older than

the other, although only differing in girth by one foot.[1]

The poisonous properties of the yew are pretty generally known; in fact, Pliny says that the adjective *toxicus*, poisonous, was once written *taxicus* from *taxus*, the yew. But in the *English Encyclopædia* is the mischievous statement—"It is now well known that the fruit of the yew may be eaten with impunity." It is quite true that the pulp surrounding the seed, with its sweet but sickly taste, does not possess the poisonous properties of the foliage and young bark; but the seed itself is deadly, numerous fatal cases having been recorded as the result of swallowing it. On the whole, therefore, it is best to give children nice chocolates on condition that they leave the pretty yew berries alone.

A yew bearing yellow berries originated at Glasnevin about 100 years ago and has been pretty extensively propagated in Ireland, but I have never happened to see it in fruit, though I have a clear recollection of the weird yew avenue at Glasnevin.

The Irish or Florence Court yew, described above, found high favour with garden designers seventy or eighty years ago, owing to its fastigiate habit; but, at best, it is a funereal object, and a more cheerful effect may be obtained by planting Incense Cedar (*Libocedrus decurrens*), Lawson Cypress or Pencil Cedar (*Juniperus virginiana*).

Dr. Prior, in his excellent work on the *Popular Names of British Plants* (1879), argued confidently

[1] *Ibid.*, p. 59.

that the names " yew " and " ivy " were but different forms of the same word ; but the late Professor Skeat declined to admit that there was any connection between them. It is an elusive element in English place-names ; Yeovil in Somerset being assigned to a totally different origin. Yeoford, in Devon, has been variously written Uford and Yewford, and may possibly be named from a yew tree, and so may Uffculme in the same county. The Gaelic *iubhar* (pronounced " yure ") is more easily recognised in the suffix -ure or -nure to many Irish and Scottish place-names. For instance, Gortinure, near Londonderry, is written *Gort-an-iubhair* in the *Annals of the Four Masters* ; Glenure in Argyll and Palnure in Galloway are respectively the glen and stream (*pol*) of the yews. The word is more closely disguised in Newry, County Down ; but that name is explained in the aforesaid *Annals* as derived from a yew planted by St. Patrick himself, whence the monastery founded there was called *Iubhar-cinn-trachta,* the yew near high tide-mark. The name was shortened into an-Iubharach, whence the transition was easy to Newry. In Galloway, Palnure is the stream of the yews, and in Ayrshire Dunure is the fort of the yew-tree.

The Cypress and its Kin

AMONG all the green things that clothe this wonderful globe—that globe which man strives so desperately to unclothe that he may pile upon it leagues of bricks and mortar, defile it with the smoke of myriad furnaces, burrow in it in pursuit of pelf to pay for still more bricks, mortar and furnaces—among these green things, I say, no group bears the badge of clanship more openly than the Cypresses (*Cupressineæ*), a branch of the great order of Conifers. It contains but a single species indigenous to the British Isles, namely, the common juniper (*Juniperus communis*), which cannot aspire to rank among forest trees. Agriculture and mineral industry have extirpated it in many districts where it once abounded; but it is still a characteristic feature in the landscape on some of the English chalk downs, in East Anglia, the Scottish Highlands, western Ireland, and other places where it has been allowed to survive. Near Capenoch, in Dumfriesshire, there remains a broad hillside thickly covered with juniper, which seems to have been the chief growth there from immemorial time.

MONTEREY CYPRESS (*Cupressus macrocarpa*)
AT WAKEHURST PLACE

The Cypress and its Kin

Tenderly as we should regard the juniper as a legacy from a bygone age, reminiscent of a scenery now no more, it has no qualities to recommend it for planting where it does not naturally grow, but the cypress group to which it belongs contains many foreign species which are capable of being turned to great advantage by British foresters. Although this group has been classified by botanists under a number of distinct genera, whereof the nomenclature has been repeatedly changed in a manner perplexing to ordinary persons, one valuable quality distinguishes all of them, namely, the durability of the timber they produce. It is recorded that the doors of the original basilica of St. Peter at Rome, erected in the fourth century, were of Mediterranean cypress (*C. sempervirens*), and that they were perfectly sound when that building was destroyed to make way for the present church in the sixteenth century.

It is not possible to trace to its source the association of this tree with human mortality. That it was so associated in Pagan civilisation may be seen from Horace's pathetic poem :

> Neque harum quas colis arborum
> Te præter invisas cupressus
> Ulla brevem dominum sequetur.[1]

The Mediterranean cypress is only hardy in the mildest parts of the United Kingdom, and is there-

[1] With all the trees that thou hast tended,
Thy brief concern is well-nigh ended,
Except the cypress—*that* may wave
Its hateful symbol o'er thy grave.
(Horace, *Odes*, ii. 14.)

fore not suitable for general planting;[1] but it has many relatives worthy of earnest attention from our foresters. About forty years ago the late Mr. Peter Lawson, of the Goldenacre Nurseries, Edinburgh, told me he expected that the American *Thuja lobbi* (as it was then called) was destined to surpass all other conifers for British planting. The name of this tree has been repeatedly changed; perhaps it is most commonly known as *Thuja gigantea*; but the Kew authorities have decreed of late that its right name is *T. plicata*. In British Columbia, Oregon, and Washington, where it is of more commercial importance than any other tree, except the Douglas fir, it is known as Red Cedar; which does not help much towards identification, as it is quite distinct from any true cedar. In its native forests it soars to a stature of 200 feet; and, although not brought to this country until 1853, has already reached a height of 100 feet in some places. The most striking example known to me of its behaviour under forest treatment in this country is at Benmore, on the Holy Loch, where about 2,000 acres were planted in successive seasons, 1871-78, and consist now chiefly of this Thuja and Douglas Fir. It is a tree most easily raised from seed, which it produces freely in this country, and it is most easily handled in the nursery. About twelve years ago I raised about 70,000 from

[1] At Monreith I have many trees thirty feet high and more, raised from seed gathered at Fiesole, near Florence, in 1878; but young plants raised from seed gathered at Gravosa, in Dalmatia, in 1907, were all killed by frost, indicating that the cypress has acquired a hardier constitution in Tuscany than those growing on the hot limestone of Dalmatia.

DECIDUOUS CYPRESS (*Taxodium distichum*)
AT SYON

15s. worth of seed; but the bulk of these, having been planted on low-lying, damp ground, succumbed to severe spring frost; while the remainder, planted on higher dry ground, now average 20 feet high. Of the timber, Professor Sargent, the leading authority on North American forestry, reports: "The wood is very valuable; it is light, soft, easily worked, and so durable in contact with the ground or when exposed to the elements, that no one has ever known it long enough to see it decay." Mr. Elwes has given a remarkable photograph of a western hemlock spruce (*Tsuga Mertensiana*) at least one hundred years old, growing astride of an enormous trunk of Thuja, which is still quite hard and sound (*Trees of Great Britain*, vol. i., plate 59). I feel convinced that when the fine qualities of this tree are better known, it will largely replace European larch in our woodlands.

Of the true cypresses there are four North American species likely to prove of high value in the United Kingdom; but in regard to them, it is of the highest importance to use only plants raised from seed. Unluckily, they all strike readily from cuttings, and many of us have formed a poor opinion of these trees from being supplied with plants propagated in that manner, which never can develop their true character, but grow into unwieldy, branchy bushes. Lawson's cypress (*Cupressus Lawsoniana*) has specially suffered in esteem from this cause; but when reared from seed, which is an easy process, it makes fine forest stock, provided attention is paid to removing superfluous leaders till the young trees are 7 or 8 feet high.

Sargent states that this cypress (which is named after Mr. Peter Lawson, who first raised it from seed in this country in 1854) often reaches a height of 200 feet, with a girth of 36 feet. It agrees thoroughly with British conditions of soil and climate; there are many in various parts of the United Kingdom from 60 to 70 feet high. The timber is of finer quality than that of *Thuja*, and equally durable; but in Professor Sargent's opinion the Nootka Sound cypress (*C. Nootkatensis*) is a more valuable tree, though slower in growth and inferior in bulk to the Lawson. While the Lawson cypress agrees with a considerable amount of moisture in the soil, provided the drainage is good, the Nootka cypress seems to do best on soil too poor and dry for the other. Both species are impatient of overhead shade and extreme wind exposure, but both are perfectly hardy and very beautiful when grown in reasonable shelter from storms.

Most rapid in growth of all the cypress tribe is the Monterey cypress (*C. macrocarpa*), but it can only be recommended for mild districts near the sea. It will not stand the frost in most inland districts, but those which I have growing within a mile or two of the coast came unhurt through the long and terrible frost of January and February, 1895, when the mercury fell below zero. This tree is remarkable by reason of its being found native only in two places, both in California, at Monterey, and on the island of Guadalupe. In neither place does it extend much beyond an area of three square miles. In maritime

districts of the United Kingdom it grows most vigorously, and ripens seed freely, forming a splendid shelter for other trees. But its branch growth is so luxuriant as to be apt to outstrip the root system; wherefore, to prevent young plants getting swung by sea winds, it is well to shorten the branches till the trees are well established.

The Monterey cypress is of a beautiful bright green, and forms a lovely hedge, for which purpose it may be propagated to any extent by cuttings; but for forest purposes seedlings should invariably be used. Mr. Elwes pronounces the timber "to be so coarse and knotty as compared with that of other cypresses, that it is not likely to be of any economic value"; but that is owing to the manner in which it is usually grown in this country, as isolated specimens, which encourages a rampant growth of side branches. Reared in close canopy, it develops fine clean boles, and Progessor Sargent reports the timber as being "heavy, hard, strong, very durable, close grained." It is indeed surprising how wood of that weight and quality can be so rapidly produced. In its own country, exposed to the full blast of Pacific gales, it appears never to exceed 60 or 70 feet in height; but there are already in the United Kingdom many taller than that, though the seeds were not brought to this country till 1838. Probably the largest Monterey cypress in England is one at Lamorran in Cornwall, which in 1905 gave a height of 86 feet, and a girth of 12½ feet.

No notice of the *Cupressineæ*, however succinct,

would be complete without mention of what is called in North America the incense cedar (*Libocedrus decurrens*), though it is of small account as a timber producer. Of all the group it lends itself most conspicuously to landscape effect, retaining its close, columnar figure quite independently of shears or side shade and distinguished by its rich, velvety, dark green foliage. It was not brought to Britain till 1853, yet there are with us many specimens over 60 feet high. Again let me warn those desiring to see the true character of this fine tree to have nothing to do with plants reared from cuttings.

The same applies to an Asiatic member of this group, namely, the Hinoki cypress (*C. obtusa*), so highly prized by the Japanese for its beautiful, satiny timber. It grows to a height of 100 feet in Japan, where it is much planted, being indigenous in the central and southern parts of the main island. It was brought to England in 1861. I have raised a quantity from seed, and it has proved quite hardy; but its growth is not nearly so free as that of the above-named American species, and it cannot be said that it is likely to be a profitable forest growth with us. It is, however, a very pretty tree in its youth.

The Wellingtonia and the Redwood

IN the vegetable world stature and bulk afford no index to longevity. The lofty pine may be but a stripling in years compared with the lowly lichen that clings like paint to the rock at its foot. One may be able to calculate pretty nearly the age of yonder massive oak; yet before the acorn whence it sprang had ripened, the primrose in its shade may have brightened many springtides with its blossoms.

Howbeit there are certain forest growths that go on adding indefinitely to their bulk during such vast spaces of time as almost to stagger the imagination. The man who can contemplate unmoved a tree, still growing vigorously, which was flourishing when Aaron's rod budded before Pharaoh must be of sterner stuff than most of us; yet such trees may be seen, if the German botanist Mayr's estimate be correct of the age of the largest Wellingtonia which he measured. This giant at 13 feet above the ground was 99 feet in circumference, 11 yards in diameter, and showed

4250 rings of annual growth. Even if Sir Joseph Hooker's cautious view be adopted that this species of tree may make two rings of growth in each year, that carries one back to a time centuries before our country became a province of the Roman Empire.

When seeds of this giant tree were first brought to England by Mr. J. D. Matthew in 1853, we Britons named it *Wellingtonia* in pious memory of the Iron Duke, who had breathed his last in the previous year, and that is still the name it goes by popularly with us. Americans, not less patriotically, called it *Washingtonia*; but we are now bidden by botanists to speak of it as *Sequoia*, a genus of conifers composed of only two species. *Sequoia gigantea*, then, is the mightiest of evergreens, for although the other species, the Redwood (*S. sempervirens*), may exceed it in stature, ranging to a height of 340 feet, it does not build up such an enormous trunk. The largest Redwood measured by Dr. Mayr in 1885 was 308 feet high, but not more than 46 feet in girth at 6½ feet from the ground. Its bole was clear of branches to a height of 230 feet. It may enable readers to realise these vast dimensions if they bear in mind that Messrs. Elwes and Henry have not found a tree of any kind in the British Isles 150 feet high, except the great black Italian poplar at Albury Park, and here and there a larch and spruce reaching to that stature.

Sixty years' experience has proved to British planters that, given suitably generous soil and adequate shelter, the Wellingtonia can be grown in these

islands as successfully as in its native district, to wit, the western slopes of the Sierra Nevada of California between the altitudes of 5,000 and 8,500 feet. Indeed, there is no reason to doubt that, in sheltered glens and river valleys, it is capable of attaining in the Old World dimensions as great as those it has reached in the New. Owing to the ease with which they can be raised from seed, Wellingtonias have been very widely distributed through British and Irish counties, and there are already many of 100 feet and upwards in height—an astonishing growth for less than half a century. Thus a Wellingtonia at Fonthill, which is known to have been raised from seed in 1861, was 102 feet high in 1906, with a girth of 17 feet, being then only 45 years old. This tree stands in a favourably sheltered hollow, and so does one of the tallest I have seen in this country, namely, one at Albury Park, which stands on the brink of the lucid Tillingbourne. This tree, planted in 1857, was 54 feet high in 1879, and 97 feet in 1913.

It is obvious that, under ordinary conditions, the Wellingtonia in this country must outstrip all surrounding trees of other sorts, and suffer from wind exposure, unless planted in close forest of its own kind. It must be confessed that he would be ill-advised who should devote good land to such a crop, for the timber of Wellingtonia, though very durable, is weak, coarse, and quite unsaleable in the European market. Unhappily, the inferiority of the timber has not protected the trees from the reckless destruction of the beautiful forest by lumberers. Huge trees

have been felled which, in falling, have smashed many others; fires have been frequent, and it is not unlikely that this, the mightiest of all green things of the earth, would have been exterminated ere this, but for protective State legislation. "Big Tree wood," says Professor Jepson, "has extraordinary durability, fallen logs in the forest having remained sound for several centuries. It is used for posts, farm-buildings, shingles, raisin-trays, and for stakes in vineyards. It seems unfortunate that timber of such magnificent proportions cannot be applied to larger purposes than grape-vine stakes."[1] Professor Jepson undertook a census of the remaining forest; from the list published in his *Silva of California* it appears that there are still scattered groves over an area of some 38,000 acres, although in one of these groves there are only six trees left, while some others contain no more than from 30 to 150. In twenty-two groves, however, the trees were so numerous that they were not counted.

Seeing that British planters must not look for any profit from the timber which is so liberally produced by the Wellingtonia, there remain only its decorative qualities to recommend it. These are considerable, provided right advantage be taken of them. Isolated specimens in sheltered places grow into majestic objects with broadly buttressed trunks and dense green curtains of leafage; but perhaps the most impressive effects are obtained by setting Wellingtonia in formal avenues. Such an avenue

[1] *Silva of California*, p. 145.

was planted by the late Mr. Walter of Bearwood at Wellington College in 1869. This avenue is 1,200 yards long and 25 yards broad; the trees were planted 54 feet apart, and as they now average 80 feet high, and are clothed with verdure from the ground to the summit, the effect is very stately and impressive.

Turning now to the other species in this genus—the Redwood (*Sequoia sempervirens*), we have a tree equalling, or even excelling, the Wellingtonia in height, and greatly its superior both in beauty and economic value. Originally this splendid tree occupied a far more extensive area in California and Oregon than the Wellingtonia; but lumberers have swept away great tracts of forest. In one respect the Redwood resists extermination better than any other of its kin, being almost, if not quite, unique among conifers (the yew being no longer classed as a conifer) in sending up suckers profusely, which secures natural regeneration after the parent trees have been felled.

The Redwood Park in California is a tract of forest 3,800 acres in extent which the State Legislature secured at a price of 250,000 dollars in order to preserve the forest in perpetuity.

"It is," says Mr. Elwes in *The Trees of Great Britain*, "the most impressive of all forests, being remarkable not only for the immense size of the trees, but also for their extraordinary density on the ground. A single acre has yielded 100,000 cubic feet of merchantable timber.[1] . . . I saw a stand close to Smith River where the trees were of enormous size and of incredible density on the ground. One tree measured 51 feet in girth."

[1] Professor Jepson states that "stands of 125,000 to 150,000 feet, board measure, to the acre, are not uncommon," *op. cit.* p. 151.

The Wellingtonia

The Redwood was first introduced to Great Britain about 1847, and has proved fairly hardy if protected from frost in the seedling stage. It is, however, impatient of wind exposure, and seldom displays its best qualities unless planted in close forest. In suitable environment this tree develops into one of the most beautiful trees imaginable, owing to its stately habit, deeply fissured bark of a rich russet hue, and luxuriant, glossy foliage.

Three Redwoods were planted in a glen at Cuffnells, near Lyndhurst, in 1855; these measured in 1906 from 98 to 105 feet high, with girths from 10 to 15 feet. This shows an average annual increase of height of 2 feet over a period of fifty years, which is far in excess of any other tree grown in the British Isles, not excepting the Wellingtonia. The consequence is that, as the Redwood has nowhere been planted in extensive masses, the leaders are peculiarly liable to be destroyed by high cold winds. Moreover, the quality of the timber produced in Great Britain cannot be rightly estimated until the trees shall have been subjected to close forest treatment, for in isolated specimens the texture of the wood is spoilt by excessive width between the annual rings.

Having regard to the value of Redwood timber exported from America, and the rapidity with which it is developed, this species is well worth attention from any person or corporation planting on a large scale in a sufficiently humid climate, for it is to be noted that it is very impatient of drought. The Redwood Belt, extending from Sonoma County to

Del Norte County, enjoys an average annual rainfall of 50 inches. Much less than that will serve the tree in the British Isles, owing to the sun being far less powerful over here than it is in California. Propagation is done from suckers, for, as is the case with some other trees—the English elm, for instance—the production of fertile seed is diminished or disappears with the acquirement of the suckering habit.

It has been claimed for the Redwood that it is the tallest growth in the world; but Australians dispute its title to that distinction on behalf of *Eucalyptus amygdalina*. The data for a verdict are as follows: In 1896 Professor Sargent measured a Redwood felled on the Eel River, and found it to be 340 feet high and 31 feet 3 inches in girth at 6½ feet from the ground. The rings of annual growth numbered 662. On the other hand, the height of two fallen eucalyptus have been recorded as 420 and 471 feet (the dome of St. Paul's Cathedral is 404 feet high); but Mr. Malden, Director of Sydney Botanic Garden, has declined to receive these measurements as trustworthy. It is very much to be desired that the truth should be ascertained before it be too late.

Not far in kin from the Redwood is the Western Hemlock (*Tsuga Albertiana*), not to be confused (as it often has been by nurserymen and planters) with the Canadian Hemlock (*T. Canadensis*), which is a tree of very inferior beauty and merit to the other. The Western Hemlock forms splendid forests in British Columbia, Washington and Oregon, attaining its greatest dimensions near the sea-coast, where

The Wellingtonia

Professor Sargent has recorded specimens 200 feet high and 20 or 30 feet in girth. Introduced to Great Britain by Jeffrey in 1851, it has proved itself contented with our climate, and is certainly one of the loveliest of exotic conifers. There are now many specimens in the United Kingdom measuring from 70 to 100 feet high. It is frost-hardy; but, to develop its true grace, must have shelter from wind exposure. Sargent reports very favourably of the timber, which is said to be disliked by rats and mice; but it does not seem to have been imported into Europe. Seed is plentifully produced, wherefore there is no excuse for the nefarious trick of reproduction by cuttings.

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GINGKO BILOBA
At the Grove, Watford

The Gingko

THE Gingko or Maidenhair-tree (*Gingko biloba*) is among the most interesting of trees, owing to its being, like the Araucaria, a survival of the vegetation prevailing when the aspect of our globe was very different from that which it bears now. Both Gingko and Araucaria were classed as conifers by the older botanists; but certain archaic features in each have been recognised as justifying their rearrangement in two separate natural orders.

The gingko has not been found anywhere in a wild state, and owes its preservation from an extremely remote past to the care which the Chinese have always shown to preserve part of the natural forest round their temples. It is in such situations that it is now found in China, Corea, and Japan; but Dr. Henry suggests that it may not improbably exist in the unexplored forests of central China.

The true affinity of this strange tree is with the ferns and cycads, dominant orders in the Mesozoic world. It is, however, a true phanerogam or flowering plant, the male and female flowers being born on separate trees. The fruit and leaves found in the

Lias clay at Ardtun, in the Isle of Mull, have been pronounced indistinguishable from those of the existing species.[1] What a vast chasm of time divides us from the summers when these fruit and leaves were produced! Since they fell our land has been ploughed and scarred by the land ice of successive glacial periods, each enduring for unnumbered thousands of years; yet these fragile relics, drifting into clefts and crannies and overlaid by the clay which the ice ground out of the rocks, have survived the rocks themselves. And now the climate of these islands has been tempered again, so that the gingko finds a congenial home in our pleasure grounds.

It is a very beautiful tree, provided it is raised from seed, or, at least, propagated by layers. Unluckily, planters are very apt to be supplied with young trees reared from cuttings, which never turn out well, for seed is seldom produced in this country, owing to the different sexes not being planted together, and the rapidity with which imported seeds lose their vitality. The foliage is unlike that of any other tree grown in Great Britain, the leathery, light green, fan-shaped leaves suggesting the design of a gigantic maidenhair fern, whence it used to be known botani-

[1] It is nowhere truly wild, and is a relic of a very ancient flora. Geological evidence shows that it is the last survivor of an ancient family, which flourished during Secondary times, and can even be traced back to the Primary rocks. In Mezozoic times this genus played an important part in the arborescent flora of north-temperate regions. Fossil remains, almost identical with the present existing species, have been found, not only in this country and North America, but also in Greenland.—*A Naturalist in Western China*, by E. H. Wilson, ii. 45.

cally as *Salisburia adiantifolia.* The foliage turns a beautiful clear yellow in autumn.

The first European botanist to mention the gingko was Kæmpfer, who found it in Japan in 1690, but it was not introduced to England until more than sixty years later. In Scotland it does not seem to have been often planted, though it is quite hardy in the milder districts. The only considerable specimen I have seen north of the Tweed was one 40 or 50 feet high on the banks of the Ayr at Auchincruive. This was blown down some years ago, but when I saw it last it was growing vigorously from the stool.

There are many fine gingkos in England. The finest known to me are at The Grove, near Watford, 68 feet high, with a girth of 8 feet 5 inches in 1904 (see plate at page 228). One at Panshanger, in the same county, of which I did not measure the height, was reported to be 70 feet, and I found the girth to be 8 feet. Both of these are most graceful, vigorous trees, but they must yield in stature to one at Melbury House, near Dorchester, which has reached a height of more than 80 feet. No tree-lover who has seen such fine examples as these can fail to regret that more frequent use has not been made of the gingko in ornamental planting. That is its proper function with us, for the timber is of no more than mediocre quality.

Many fine gingkos may be seen in the Loire valley, at Geneva, and in northern Italy ; but nowhere have I been so much impressed with their decorative qualities as in the beautiful city of Washington,

where they have been planted in a long avenue along one of the principal streets. True, they have not yet attained a great stature—from 30 to 40 feet are the tallest—but their verdure is most refreshing in that sun-baked capital, and it is easy to imagine what they may become at their present free rate of growth.

The gingko is particularly well suited for a town atmosphere. In the most malodorous part of evil-smelling Brentford, close to a brewery and opposite a huge gaswork, stands the wreck of a fine one. Jammed in between grimy buildings, it has lost its top, but each spring it still hangs out its fairy leafage over the dingy thoroughfare.

AVENUE OF ARAUCARIA IMBRICATA
At Castle Kennedy, Wigtownshire

The Araucaria

VERY different in habit and appearance from the lightsome gingko is the araucaria or puzzle monkey, but, like the former, it is a survival of the vegetation that flourished in the carboniferous era, when it had to compete with giant ferns, cycads, and horse-tails, and attained its utmost development in the Jurassic landscape. Of the ten known species of araucaria, all indigenous only in the southern hemisphere, only one is hardy in Great Britain—*A. imbricata*—which forms forests on the mountains of southern Chile.

This tree was first brought to England in 1795 by Archibald Menzies, who, visiting Chile with Captain Vancouver, sowed some araucaria nuts on board ship and brought home six live seedlings. It was not till 1844, however, that any fresh supply of seeds reached this country, when William Lobb, collecting for the firm of Veitch, secured a large quantity. The quaint character of the tree, the readiness with which the seeds germinated, and its thorough adaptation to British soil and climate soon caused it to be widely distributed, so that at this day there is

no tree with which people are more familiar than the puzzle monkey. At the same time, there is no tree which has suffered so much from injudicious planting among inappropriate surroundings. It is a creature demanding broad light and free, pure air; and I know of no more dismal object in the world of plants than an araucaria stuck down in front of a suburban villa, stifled with smoky deposit, retaining a despairing grip of life, whereof the only visible sign is the green tips of its poor blackened branches. It is treatment such as this which has caused the araucaria to lose favour with British planters. To realise what this tree is capable of in our hands, one has but to visit the Earl of Stair's grounds at Castle-Kennedy and stroll down a wide grassy avenue, two hundred yards in length, bordered on either side by araucarias over 50 feet high (see plate at page 232).

Effective in a different fashion must be the araucaria grove at Beauport, Sussex, which I have not seen. Here a number of these trees were planted about fifty years ago, and allowed to grow in forest canopy, the inner ones clearing their boles naturally. The largest of these, measured by Dr. Henry in 1904, was 74 feet high, with a girth of 7 feet 9 inches.

Again another effect. On the west shore of Loch Fyne, united to the mainland by a narrow neck of shingle, is Barmore Island, a grassy, rocky pile, treeless save for a solitary araucaria which some freakish hand has planted many years ago high on the northern slope. The impression received from this lonely foreigner is very enduring. (Let me not be misunder-

Male Flower — ARAUCARIA IMBRICATA — Female Flower

stood. I do not mean the physical impression, which would be distinctly disagreeable; but the mental one, which is most pleasing.)

Araucaria timber is said to be like good deal, but smoother and heavier. Like most primitive types of vegetation, the trees are of separate sexes, though exceptionally a tree may be found bearing male and female flowers. The male inflorescence is like a large, brown, pendant catkin, 4 or 5 inches long; the huge female cones take two years to ripen, when they open, and each discharges 200 or 300 large seeds, 1 to 1½ inch long. These seeds are freely produced in nearly all parts of Britain; self-sown seedlings spring up where the undergrowth permits them; and as an article of food the kernels are not to be despised when cooked as chestnuts.

The araucaria is one of many South Chilian plants which relish the climate of western Britain and Ireland. The character of climate in these widely-separated regions is curiously similar, though from diametrically opposite causes. In Chile abundant moisture arises from the afflux of a cold ocean current upon a warm coast; in the British Isles a warm ocean current flows upon the colder land.

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